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1.0 INTRODUCTION

The Airport Layout Plan (ALP) and ALP Narrative Report for the Port of Whitman Business Air Center (POWBAC), previously known as the Whitman County Memorial Airport, is being updated by the Port of Whitman County to examine the aviation needs of the airport. USKH, Inc. was retained by the Port of Whitman County to assist the airport and provide guidance for the future development of the airport over the next twenty years. USKH has provided engineering and planning services for the ALP update. The ALP update was funded with a 95% grant from the Federal Aviation Administration (FAA), 2.5% grant from the Washington State Department of Transportation Division of Aviation, and the remaining 2.5% match funded by the Port of Whitman County.

The ALP update follows the April 1997 FAA, Northwest Mountain Region, Checklist Guidelines for Airport Layout Plan Narrative Reports and Airport Layout Plans. The recommendations in the ALP update comply with current design standards in the FAA Advisory Circulars (AC).

The 95% financial assistance for this ALP update is provided by the FAA Airport Improvement Program (AIP), under Title 49, United States Code, Section 47104. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development recommended here nor does it indicate that the proposed development is environmentally acceptable or in accordance with appropriate public laws.

The recommendations of the ALP Report are designed to build and strengthen the future of the airport into the community's primary air transportation facility. The information in the updated ALP Narrative Report provides the Airport Board and local community leaders with recommendations that allow appropriate decisions to be made regarding the future operations and development of the Port of Whitman Business Air Center.

This narrative report and plans update the previous 1990-2010 Whitman County Memorial Airport Master Plan (TRA/W&H Pacific) and extends the planning horizon to 2025. In addition to a detailed description of existing conditions and design criteria, the ALP Narrative Report:

- Examines and evaluates the recommended improvements described in the 1990 Airport Master Plan;
- Examines previous planning recommendations as appropriate to assist in analyzing the current and projected airport facility needs per the established airport planning criteria;
- Determines current and future aviation activity and facility requirements;
- Prepares development options and a detailed 20-year Capital Improvement Program (CIP) that schedules priorities of improvements and estimates development costs.
- Includes current and ultimate conditions of the airport layout plan, airspace plan, and land-use plan for the airport and its surrounding areas.



As an airport in the National Plan of Integrated Airport Systems (NPIAS), the POWBAC is eligible to receive federal and state funding for airport improvements. However, the airport is required to have a current ALP and ALP Narrative Report. This ALP update will allow the Port of Whitman County to pursue funding for airport projects, as funding allows.

1.1 ALP SUMMARY RECOMMENDATIONS

The recommendations below are based on USKH's analyses of existing conditions at the airport and the anticipated need for current and future improvements. In addition, the previous ALP was reviewed and assessed, several planning and informational documents were obtained, and meetings were held with the Port of Whitman County, airport board, and airport users to provide an ALP that meets the needs of the airport and its community. The recommendations are as follows:

- The airport should maintain the Airport Reference Code of B-1 small (ARC B-I small).
- Runway safety areas beyond both ends of the runway and shoulders should be graded.
- Taxiway A should be realigned and improved as soon as possible.
- Runway and taxiway markings should be completed.
- Runway and taxiway lighting improvements should be corrected and/or installed.
- Additional apron space should be constructed to accommodate aircraft tie-downs, aircraft hangars, and vehicle parking.
- An agricultural loading area should be constructed.
- Existing fuel system should be replaced with a self-serving fuel kiosk card lock system.
- A new visitor/information center should be constructed.
- Airfield and vehicle signs should be installed.
- A designated parking area for one helicopter space should be constructed.
- Finalize airport boundary and legal description.
- Obtain easements for airspace (Part 77) beyond airport property.
- Obstructions should be minimized with in the runway approaches, runway protection zones, safety areas, and object free areas.

A detailed description of these recommendations is identified in this ALP update, following this section.



2.0 EXISTING FACILITY INVENTORY AND FORECASTS

This section inventories the Port of Whitman Business Air Center (POWBAC) facilities and existing aviation activity documents. The Aviation Forecast presented in the 1990 Whitman County Memorial Airport Master Plan, prepared by TRA Airport Consulting in association with W & H Pacific, is discussed and updated. Data from the following sources were used in preparation of this report:

Inventory of Documents for the Port of Whitman Business Air Center:

- Brochure, “Grow your Business in Whitman County”, Port of Whitman County; 2004
- Web Site, Colfax Industrial Park; Port of Whitman County Business Air Center, 2004
- Web Site, “Doing Business in Whitman County”; 2004
- Web Site, “Our Mission: Port of Whitman County, Washington”; 2004
- Web Site; AirNav airport data; Port of Whitman Business Air Center Airport; Feb. 19, 2004
- Survey Data and Deeds-Whitman County to Port of Whitman Business Air Center transfer; December 2003
- Documents Pertaining to transfer of ownership of Whitman Business Air Center to Port of Whitman County, 2002
- Sectional Aeronautical Chart-Seattle, 68th Edition; U.S. Department of Transportation FAA; December 23, 2004 Airport Environmental Assessment letter; Sept 7, 2001
- FAA Grant Offer to Whitman Business Air Center and related documents; August 6, 2001
- Airside letter concerning FAA grant for pavement rehabilitation; August 6, 2001
- Forecasting Aviation Activity By Airport, July 2001 (APO-110)
- Pavement Management Study for Whitman Business Air Center; WSDOT Aviation, June 11, 2001
- Construction Specifications and Contractor Submission Package for Whitman Business Air Center Improvement Project AP 48; Airside; June 2001
- WSDOT Aviation System Plan – Forecast and Economic Analysis Study (Willis, 2001)
- Washington D.O.H. letter regarding well sites; May 23, 1995
- Documents regarding beginning of airport in 1944; Early History of Airport
- WSDOT Aviation Airport Aid Grant Procedures Manual

Documents used for Port of Whitman Business Air Center Aviation Forecasting Analysis:

- Census Data from the Washington State Office of Financial Management
- Economic Data from the Northwest Income Indicators Project
- FAA Terminal Area Forecast System (TAF) data and spreadsheet, 2005
- FAA Aviation Forecast Guidance Memo, December 23, 2004
- FAA Airport Compliance Report; October 27, 2004; Cayla Morgan
- Field Formulation of the National Plan of Integrated Airport Systems (NPIAS) FAA Order 5090.3C, December 4, 2000
- Port of Whitman County Comprehensive Plan, December 2000



- Whitman Business Air Center Development Plan-Draft; April, 2000 (Airside)
- Whitman County Memorial Airport Master Plan for 1990-2010 (TRA/W&H Pacific 1990)
- WSAPS Airport System Plan Database (AD)
- WSDOT Aviation form 5010; 2005
- Washington State Continuous Airport System Plan (WSCASP)

2.1 GENERAL BACKGROUND

The Port of Whitman Business Air Center airport is located on approximately 80 acres, three miles southwest of the city of Colfax. The city of Colfax is located at the junction of Highway 26 and Highway 195, approximately 60 miles south of Spokane in eastern Washington. The city serves as the Whitman County seat. The airport serves the Port of Whitman County, Whitman County, the city of Colfax, and the surrounding area. It is adjacent to the Colfax Industrial Park. Figure 2-1 shows the location of the airport relative to Colfax and the surrounding area. Exhibit A of the ALP identifies land and provides the legal description and ownership of the airport.

Whitman County is located in southeast Washington and is bordered by Idaho on the east. Whitman County is part of the Palouse, a large physiographic region that consists of extremely fertile, deep, wind deposited soils (loess). The typical Palouse topography consists of 200' to 300' high, dune-like hills intersected by flat-bottomed valleys formed by year-round creeks. The Palouse hills frequently produce large yields of wheat and lentils.

Whitman County has a mild climate characterized by modest precipitation (17.4" per year) falling mostly in the winter and spring. The temperatures are moderated by western prevailing winds from the Pacific Ocean. The July average high temperature is 81.3 °F and the January average low temperature is 21.6 °F.

2.2 AIRPORT SITE

The airport is located outside the Colfax city limits. See Figure 2-2 showing the airport vicinity. The single runway stretches halfway across Rebel Flat, a 2000' wide valley created in the Palouse hills by Rebel Flat Creek. The west end of the runway ends at the Rebel Flat Creek drainage channel. The east end of the runway extends up a 800' wide draw between typical farmed Palouse hills that have ridge lines and summits approximately 200' above Rebel Flat.

State Highway 26 crosses Rebel Flat a half mile north of the airport site at the Palouse Empire Fairgrounds. The Colfax Airport Road, a bituminous surfaced county road, intersects SR 26 at the Fairgrounds. The Colfax Airport Road parallels the runway and forms the north boundary of the airport. Vehicle access to POWBAC and the Colfax Industrial Park is provided by a drive at the east end of the runway from the Colfax Airport Road.



2.3 AIRPORT HISTORY

The existing airport site has been in continuous use for more than 56 years. The airport has historically been maintained as a general aviation facility serving mostly light single- and twin-engine aircraft. Although the airport has not identified a loading area or operational procedures, aerial applicator aircraft are used extensively to support agricultural spraying operations. Commercial service is not provided at POWBAC. Airports, located in Pullman and Spokane, accommodate demand for passenger and airfreight service within the region.

The site of the airport, first investigated in June 1944, was found to be the best site for an airport in the area at the time. This site consisted of two parcels totaling approximately 144.1 acres. In January 1948, Whitman County entered into a Sponsor's Assurances Agreement with the Federal Airport Program to purchase and maintain the airport. The Port of Whitman Business Air Center, known then as the Whitman County Memorial Airport, went under construction and was completed in the spring of 1949 at a cost of \$76,718 including the purchase of land and was dedicated in June of 1950.

In June of 1993, approximately 30 acres of land was transferred from Whitman County to the Port of Whitman County. At a later date, an additional adjacent 8.5 acres was also transferred from Whitman County to the Port of Whitman County. This area, totaling approximately 38.5 acres, became known as the Colfax Industrial Park and was subdivided into 12 lots and plated in 1998. In November of 1997, two areas totaling approximately 25 acres of the land was transferred from Whitman County to Matark, Inc. The remaining area of the airport, approximately 80.6 acres, was operated by Whitman County until October of 2002, at which time land and ownership were transferred to the Port of Whitman County. At that time, the Port of Whitman County renamed the airport as the Port of Whitman Business Air Center (POWBAC). Refer to Exhibit A for land ownership and legal description of the airport. Refer to Exhibit 2-0 for an Airport Transfer History layout.

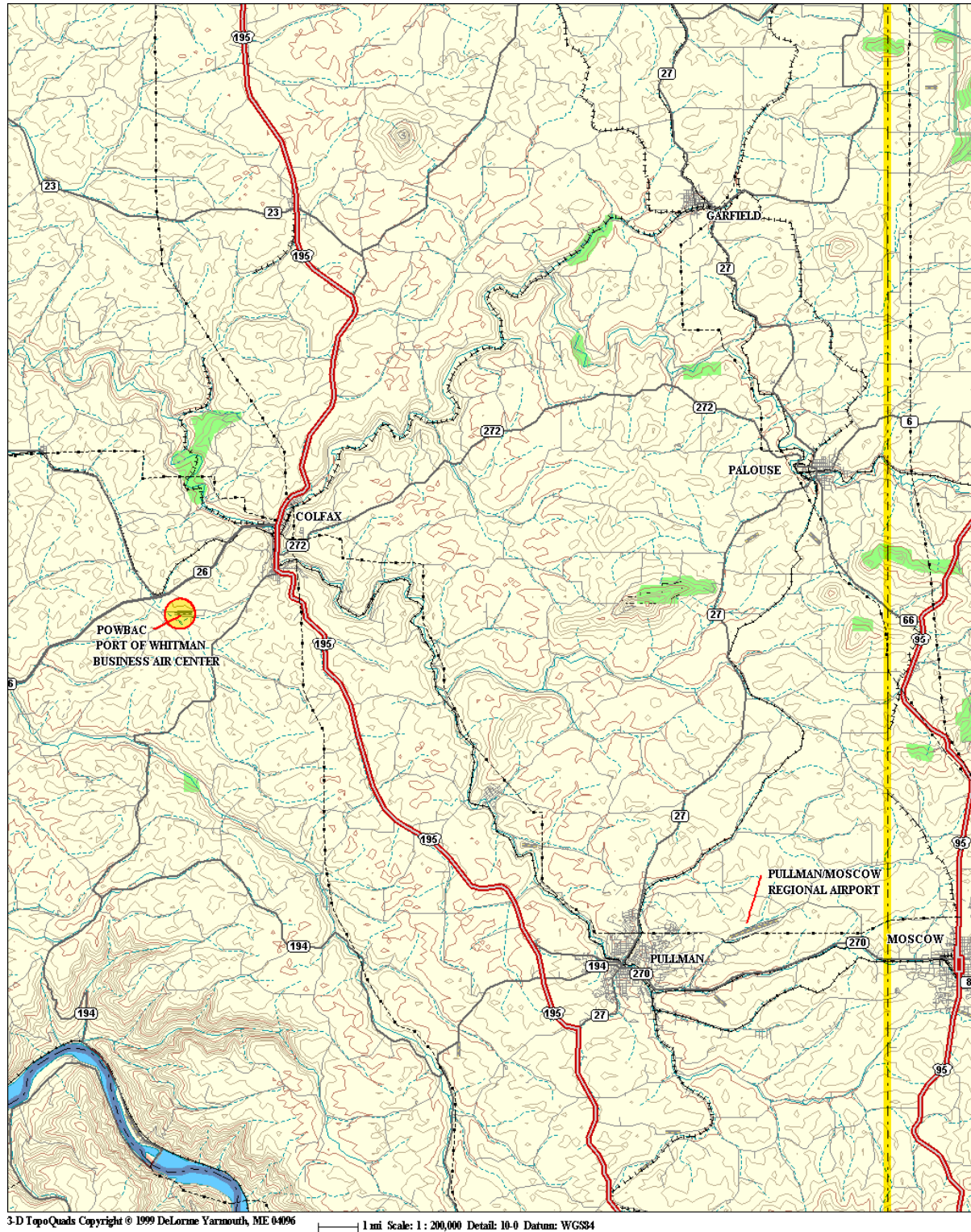


Figure 2-1, Port of Whitman Business Air Center (POWBAC) Location Map

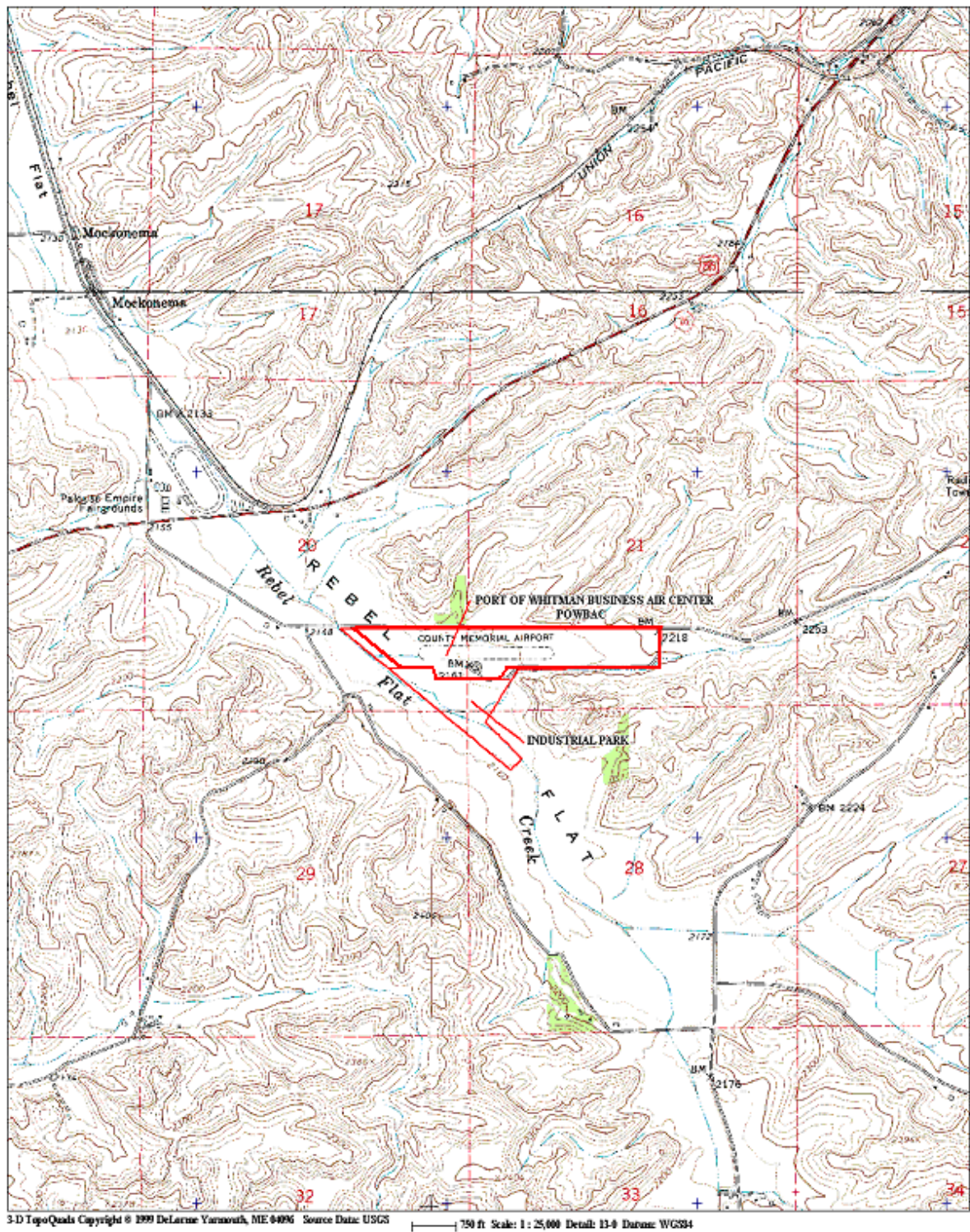


Figure 2-2, Port of Whitman Business Air Center (POWBAC) Vicinity Map



FIGURE 2-3, PORT OF WHITMAN BUSINESS AIR CENTER (POWBAC)
AERIAL PHOTO



2.4 AIRPORT CLASSIFICATION

The Port of Whitman Business Air Center (POWBAC) is classified as a General Aviation (GA) airport by the Washington State Continuous Airport System Plan (WSCASP) and the Federal Aviation Administration (FAA) National Plan of Integrated Airport Systems (NPIAS). The airport serves small general aviation weighing less than 12,500 pounds. It accommodates recreational, business and agricultural aviation users. Tables 2-1 and 2-2 summarize airport data and existing airfield conditions.

TABLE 2-1: AIRPORT DATA

Airport Name / Designation ID	Port of Whitman Business Air Center / S94
Airport Owner:	Port of Whitman County
Range, Township, County, City, State:	43E, 16N, Whitman County, Colfax, Washington
Airport Acreage	55 Acres (approximately)
Airport NPIAS Service Level:	General Aviation (GA)
Airport Reference Code:	B-I Small
Design Aircraft:	CESSNA 421
Airport Elevation:	2,180.88 Feet Mean Sea Level (MSL)
Airport Reference Point (ARP):	NAD83: Latitude 46°51'31"N, Longitude 117°24'51"
Mean Maximum Temperature:	July / August 92.8° F
Airport Instrument Approach:	Visual
Navigational AIDS	Rotating Beacon and Lighted Wind Cone, No GPS
Runway Wind Coverage (10 Knots)	98.6%

2.5 EXISTING AIRPORT FACILITIES

Runway

POWBAC has a single paved runway (Runway 7-25) with a partially paved full-length parallel taxiway (Taxiway A) and five connecting taxiways. This total runway is 3,210 feet long, 55 feet wide, and has an asphalt concrete surface with a weight-bearing capacity of 12,500 pounds for a single wheel loading. The runway's asphalt



concrete surface is in fair to good condition, having been resurfaced in 2001. The surface does show some undulation and differential settlement indicating possible subgrade failure in a few locations. The effective runway gradient is estimated at approximately one percent. The elevation



of the airport is 2180.88 feet, above mean sea level (MSL), and the approaches to the runway are visual.

Runway 7-25 encompasses displaced thresholds located at both ends of the runway. The displacement of thresholds are required for this runway due to existing terrain obstructing airspace required for approaching the runway. The removal, relocation, or lowering of this terrain is beyond the airport's property and control. Therefore these displaced thresholds were established for obstacle clearance approach (OCA) requirements. (Approaches are further discussed in the "Airspace" portion of Section 2.5.) Runway 07 threshold is displaced 492 feet from the end of the runway. The Runway 25 threshold is displaced 320 feet from the end of the runway. A total length of 3,210 feet of the runway is useable in most operations. However the available runway length for certain operations and directions are reduced. The existing runway length for takeoff run available (TORA), takeoff distance available (TODA), accelerate-stop distance available (ASDA), and landing distance available (LDA) are identified and described in further detail below:

TORA is the length of runway available and suitable for satisfying takeoff run requirements.

TODA is the TORA plus the length and any remaining or clearway beyond the far end of the TORA available for satisfying takeoff distance requirements.

ASDA is the length of runway plus stopway available and suitable for satisfying accelerate-stop distance requirements.

LDA is the length of runway available and suitable for satisfying landing distance requirements.

	Runway 7	Runway 25
TORA	3,210'	3,210'
TODA	3,210'	3,210'
ASDA	3,210'	3,210'
LDA	2,718'	2,890'

Lighting

Whitman Business Air Center is equipped with non-standard white medium intensity runway lights (MIRL) and red/green threshold lights. This system defines the edge of the runway during night operations. The runway edge lights are activated by radio contact with the common traffic advisory frequency (CTAF). The FAA Form 5010 inspection performed by W & H Pacific in May 2002 indicates deficiencies with the lighting system. Runway light cans are installed on top of the ground rather than buried, creating obstructions. Several older lights installed on metal tubing are extending approximately 1' above grade. Subgrade, tall wheat, and weeds frequently obstruct the lights. The existing taxiways are not equipped with lights or reflectors.





Markings & Signage

The runway currently has markings established for visual approach, as a result of the 2001 runway improvement project. Presently the runway is marked with runway identification numbers, centerline, taxi turn off lanes, and displaced thresholds. Three connecting taxiways are marked with center and hold lines. There are no existing airfield signs at the airport.

Parking Aprons

There are presently six tie-down locations at the airport. The airport has one aircraft-parking apron located on the south west side of the runway. The apron is on a gravel surface and is approximately 100'x 200'. The apron connects to the parallel taxiway. One row of three tie-downs is positioned with north/south facing alignment on the apron. Three additional tie-downs are located along the taxiway and encroach the existing taxiway safety areas.



Hangars

Six aircraft hangar structures are located on the south side of the airport, along the parallel taxiway. One of these hangars is a six-bay T-hangar, recently constructed by the airport.



Public Center

A small public building with a restroom and telephone is adjacent to a Port of Whitman County-owned hangar on the south side of the airport.

Utilities

Water (by well), sewer (by septic tanks), electrical, and telephone services exist. Electrical service extends to the airport for runway lights and other associated airfield lighting.



Agricultural Aircraft Facilities

Port of Whitman Business Air Center has supported agricultural aircraft spraying operations for many years. There are currently two agricultural spraying companies based at the airport. Both of these companies currently use an agricultural bi-wing aircraft, known as the Grumman G-164 Ag-Cat. A total of four of these aircraft exist at POWBAC. Existing facilities include privately owned aboveground tanks, barrels, water storage tanks, and equipment storage areas located at the airport. Most aerial applicators, based and itinerant, currently use Taxiway 'E' as a loading area, which creates a safety concern.



Grumman G-164 Photo (above) by Neville Murphy

A public loading area or operational procedures, meeting all state and local regulations, have not been established or implemented at the airport.

Fuel

The airport does not currently provide fuel. 100LL of fuel is available for emergencies and 100LL of fuel can be arranged in advance from Fender Air Services.

TABLE 2-2: AIRFIELD DATA

Runway Dimensions	Runway 3210' x 55'
Runway Gradient	0.99%
Runway Surface	Asphalt (Good Condition)
Runway Pavement Strength	12,500 – Single Wheel Landing Gear
Runway Marking	Visual (r/w designation, centerline; & displaced threshold markings)
Runway Lighting	Medium Intensity R/W and Threshold Edge Lights (MIRL) (nonstandard)
Taxiway Dimensions	Parallel Taxiway 3210' x 25' (Varies)
Taxiway Surface	Partially Paved (Good to Failed Condition)
Taxiway Marking	Aircraft Hold Lines; Taxiway Lead-in Lines (yellow paint)
Taxiway Lighting/Reflectors	None
Runway-Parallel Taxiway Separation	200' to 230' (Varies)
Aircraft Parking Apron	Minimal Space: 6 (nonstandard) aircraft spaces and hangars



Navigation Aids

The airport is not equipped with any electronic navigational aids or visual guidance indicators (VGI), such as precision approach path indicators (PAPI), on the runway. The airport is equipped with a Rotating Beacon and Lighted Wind Cone. Refer to Table 2.3 for a summary on existing navigational aids.



Airspace

There are no established instrument approaches and no visual approach aids to assist aircraft into the airport, as discussed above in the “Navigation Aids” portion. The airport operates under visual flight rules (VFR).

The airspace that surrounds the Port of Whitman Business Air Center is relatively hilly farming terrain, with no trees. Existing terrain obstructions, discussed earlier in the “Runway” portion of this section, created potential conflicts with the runway approach for landing aircraft. This led to displacing both runway threshold ends, based on siting requirements, in order to meet obstacle clearance approaches (OCA). The current approaches are based on visual runways expected to serve small airplanes with approach speeds of 50 knots or more.

TABLE 2-3: NAVIGATIONAL AIDS AND RELATED ITEMS

Type	Facilities
Electronic Navigational Aids	None
Instrument Approaches	None
Weather Observation	None
Communication	Common Traffic Advisory Frequency (CTAF) (122.8 MHz)

2.6 SOCIOECONOMIC DATA

Population Data

Population in Whitman County declined slightly from 1980 to 1990 and has increased slightly since then.¹ Whitman County is characterized by small communities scattered over a large land area. Currently, only 15% of the county’s population resides outside incorporated communities. Over the last twenty years, the decline in the rural population has been more than offset by the growth of the City of Pullman, which is growing at twice the rate of Colfax. In 2004, the Washington State Office of Financial Management estimated the Pullman population at 25,905. The Washington State Department of Community Trade and Development forecasts a +10% increase in the County’s population by 2025. Table 2-4 summarizes recent population trends for Colfax, Pullman, and Whitman County.

¹ Population estimate generated by Washington State Office of Financial Management and US Census.



TABLE 2-4: POPULATION DATA

Area	1980	1990	2000	Annual Growth Rate (1990-2000)	2002	2004
Colfax	2,780	2,761	2,844	0.30%	2,820	2,845
Pullman	23,579	23,478	24,948	0.63%	24,910	25,905
Whitman County	40,103	38,775	40,740	0.51%	40,600	41,700

Source: OFM Forecasting State of Washington

The OFM prediction of 0.53% closely tracked the actual County population growth rate of 0.51%.

Economic Data

Whitman County has historically experienced unemployment rates below the state average. In April 2004, Whitman County had an unemployment rate of 1.8%, lowest in the state and well below the state average of 6.3%.

More than 80% of the county land area is in farm use. In 2002, Whitman County had 1,328,337 acres in farm use, down 6% from 1,404,284 acres in 1992.² Most economic activity indicators in Whitman County declined from 1980 to 1990 reflecting a decline in farm acreage and income. The economic decline mirrored the slight population decline in that decade. Table 2-5 summarizes recent economic data for Whitman County.

TABLE 2-5: WHITMAN COUNTY ECONOMIC DATA

Economic Activity Indicator	1980	1990	2000	2002
Per Capita Income	\$16,308	\$16,569	\$19,802	\$19,629
County Industry Earnings	\$490,994	\$489,221	\$633,652	\$627,560
Total Personal Income	\$655,576	\$643,848	\$805,941	\$803,179

Source: US Bureau of Economic Analysis (BEA) Data expressed in year 2000 dollars.

Since 1990, economic activity has increased substantially indicating that the county economy is no longer being driven by agriculture. The 2000 census found that only 2% of the county population was employed in agriculture while over 45% were employed in management and professional occupations. Approximately 50% of all workers are employed in public administration or educational, health and social services.

The City of Pullman is the economic hub of the county. The Pullman economy is centered on Washington State University, the largest single employer in the County. In addition, several high technology spin-off companies, such as Schwietzer Engineering Laboratories, have experienced strong growth over the last ten years. These knowledge-based companies pay much higher wages than the traditional agricultural economy could provide.

² United States Department of Agriculture, 2002 and 1992 Census of Agriculture



Whitman County is a typical example of an agricultural community profiting from the education dividend. Those few rural counties showing economic growth in the northern Rocky Mountain Region and the Pacific Northwest are increasingly linked to higher education institutions. Other examples in the Northwest are Latah County in Idaho, home of the University of Idaho; and Gallatin County in Montana, home of Montana State University.

2.7 AIRPORT ACTIVITY DATA

Based Aircraft

Based aircraft are those aircraft that are stored and operated out of the Port of Whitman Business Air Center. Table 2-6 summarizes the historical number of based aircraft. W & H Pacific forecasted the number of based aircraft at the airport in the 1990 Master Plan by developing a historical ratio of 3.2 based aircraft per 10,000 persons in Whitman County. Forecasts based on this ratio, along with the WSDOT and FAA forecasts are included in Table 2-6. The reported based aircraft for 2005 was obtained by the airport manager. In addition, the Port of Whitman County verified this inventory with their leases. Currently the Port of Whitman County has leased 10 hangars, consisting of 4 large hangars and 6 T-hangars, housing a total of 20 aircraft at the airfield.

TABLE 2-6: REPORTED BASED AIRCRAFT COMPARED TO 1990 PROJECTIONS

Year	1990	1995	2000	2005
Reported Based Aircraft*	12	12	13	20
Projected (Assumed 3.2 aircraft per 10,000 county residents)*	12	12	13	13
1987 WSDOT Forecast	12	14	16	18
FAA Forecast**	12	12	13	13

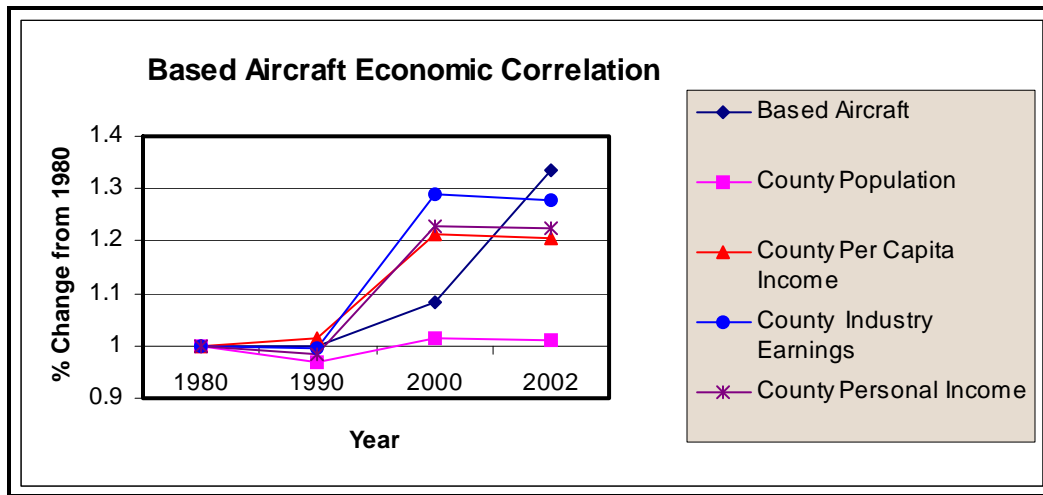
*1990 Master Plan and verbal report/inventory from POWBAC manager for "2005 Reported Based Aircraft".

**Compiled from FAA 5010 form estimates.

The number of based aircraft at the Port of Whitman Business Air Center may have not been accurately predicted by any of the forecast methods presented in the 1990 Master Plan. Table 2-7 shows that the percent change in the number of based aircraft does not correlate with the % change in county population since 1990 (Correl. Factor = 0.56). The percent change in the number of based aircraft has a much stronger correlation with county personal income (Correl. Factor = 0.75) and per capita income (Correl. Factor = 0.74).



TABLE 2-7: BASED AIRCRAFT ECONOMIC CORRELATION



The Northwest Income Indicators Project at Washington State University processed US Bureau of Economic Analysis data to clearly present economic trends in Washington counties. The project defines Personal Income as “*the income received by all persons from working (participating in production), from government and business transfer payments, and from government interest. Personal Income is the sum of net earnings by residence, rental incomes of persons, personal dividend payments, personal interest income, and transfer payments [such as Social Security and Medicare...It is] measured before the deduction of income taxes and other personal taxes. Personal income estimates are also the best available local level indicator of general purchasing power, and are therefore central to tracking and comparing county patterns of economic growth and change.*”

The substantial increase in disposable income and purchasing power in Whitman County is a factor in the recent increase in based aircraft at the Port of Whitman Business Air Center. Another equally important factor appears to be the moratorium on construction of new hangars for general aviation at the Pullman/Moscow Regional Airport. Rob Parish, Pullman/Moscow Airport Manager reported that based aircraft at the Pullman/Moscow Airport has remained static (in the high 60’s) over the last twenty years. No new T-hangars have been constructed since 1998 because the existing water system cannot provide fire flows to the airport that are required by the local Fire Marshal. Proposed runway modifications at Pullman/Moscow airport would allow additional general aviation aircraft hangars to be built in the future.

The resulting hangar shortage has forced new aircraft owners over the last five years to locate their aircraft at nearby general aviation airports, such as the Port of Whitman Business Air Center or at private airstrips. A private airstrip, located two miles south of Palouse, operated by Dale Schoepflin as Dale’s Flying Service, has catered to the local demand for new hangar space by



building 16 new hangars. Dale's airstrip now has 18-based aircraft with additional hangar space for four GA aircraft. Owners of other airstrips near Pullman and/or Moscow do not appear to be offering GA hangar services to the public. Fountain's Airport, on the edge of Moscow, has three hangar spaces available, but is not planning to market them. Dorn Rogers operates Cascade Flying Service at a private airstrip north of Palouse. Mr. Rogers has four based aircraft and has no plans to offer hangar space to the public. A private strip, owned by Stout Air, east of Genesee has no hangars available to the public. The private Anderson-Plummer airstrip, located just west of Potlatch also has no plans to offer hangars to the public. The Oakesdale airport has four based aircraft with no known plans for hangar expansion. The hangar spaces in Willard Field in Tekoa are filled to capacity by aircraft of Spokane owners. Rosalia and Tekoa are located far enough north to be outside the Pullman/Moscow market and are a part of the Spokane market.

Growth Scenario

The FAA understands that the moratorium on hangar Construction at the Pullman/Moscow Airport will be lifted within the next year. AIRPAC Data, compiled March 10, 2005 reports 144 registered aircraft in Whitman County. Currently the Whitman Business Air Center has 20 based aircraft and has captured 14 % of the County general aviation aircraft market.

The growth in general aviation aircraft requiring hangars is assumed to match the 1.67% annual Whitman County personal income growth rate per the above discussion. By 2010 the POWBAC taxiway will be reconstructed and paved; ten additional tie-down spaces will be added; and a fuel kiosk with card lock system will be in operation. These new improvements at the Port of Whitman Business Air Center will allow the airport to retain its share of the general aviation hangar market into the future. We estimate that with these improvements, the Whitman Business Air Center will continue to capture 14% of the county general aviation market into the future.

TABLE 2-8: BASED AIRCRAFT FORECAST

Year	County Based Aircraft**	County wide Growth in Based Aircraft**	New Aircraft Based at POWBAC (14% of Market)	Total Aircraft Based at POWBAC
2005*	144	0	0	20
2006	146	2	0	20
2007	148	4	0	20
2008	151	7	1	21
2009	153	9	1	21
2010	156	12	1	21
2011	159	15	2	22
2012	161	17	2	22
2013	164	20	2	22
2014	167	23	3	23



2015	169	25	3	23
2016	172	28	4	24
2017	175	31	4	24
2018	178	34	4	24
2019	181	37	5	25
2020	184	40	5	25
2021	187	43	6	26
2022	190	46	6	26
2023	194	50	7	27
2024	197	53	7	27
2025	200	56	8	28

- *Registered Aircraft in 2005, AIRPAC Data compiled March 10, 2005.
- ** Assumed Annual growth = 1.67%.

TABLE 2-9: BASED AIRCRAFT FORECASTS

Forecast Method	2005	2010	2015	2020	2025
USKH Forecast Growth	20	21	23	25	28
2000 WSDOT Forecast*	14	14	14	NA	NA
FAA Forecast (TAF)**	16	16	16	16	NA

* Table 1J, Aviation System Plan – Forecast and Economic Significance Study, 2001, prepared by Willis and Ratliff Corp.

**Forecast Issued January 2005.

Fleet Mix

The number of multi-engine and turboprop aircraft has remained the same at the Port of Whitman Business Air Center while the number of single engine aircraft has increased. The historic and current fleet mix is shown in **Table 2-10**. All future growth is assumed to occur with single engine aircraft.

TABLE 2-10: AIRPORT FLEET MIX

Aircraft Type	1990	2000	2005	2010	2015	2020	2025
Single Engine	10	11	18	19	21	21	24
Multi-Engine	0	0	0	0	0	1	1
Turboprop	1	1	1	1	1	1	2
Rotorcraft	1	1	1	1	1	1	1

Annual Operations

An aircraft operation is defined as a takeoff or landing. This Master Plan Update forecasts operations in accordance with Forecasting Aviation Activity by Airport, July 2001, prepared by the FAA Office of Aviation Policy and Plans, Statistics and Forecast Branch (APO-110). The



FAA has subsequently provided further guidance on preparing Aviation Forecasts with Memorandums issued May 31, 2002 and December 23, 2004.

Non-towered, general aviation airports such as the Port of Whitman Business Air Center rarely record actual field counts of aircraft operations. APO-110 requires that *“Historic general aviation operations levels at non-towered airports should be evaluated for their reasonableness by calculating the number of annual GA operations per based aircraft. Guidelines for annual operations per based aircraft are provided in FAA Order 5090.3C, Chapter 3.”*

FAA Order 5090.3C, Section 3.2.c provides the following guidelines for estimating annual operations per based aircraft. *“A general guideline is 250 operations per based aircraft for rural general aviation airports with little itinerant traffic, 350 operations per based aircraft for busier general aviation airports with more itinerant traffic, and 450 operations per based aircraft for busy reliever airports.”*

The FAA Order establishes operations estimates that are considerably lower than previously used for this airport. The 1990 Master Plan assumed that each based aircraft would generate 1,000 operations per year. The Terminal Area Forecast (TAF) assumed that 16 based aircraft would generate 8500 operations resulting in 531 operations per based aircraft.

Additional Operations

Due to agricultural aerial spray services at the Port of Whitman Business Air Center, operations have been included to account for this function. Approximately two aerial applicators can add up to 2,500 operations to the airport forecast. The operations forecast has been increased by 2,500 operations to include agricultural spray operations.

Interstate Aviation operates a flight school out of Pullman/Moscow regional airport which frequently conducts “touch and go” operations at nearby airports. Doug Gadwa, manager, estimates that his instructors average approximately one landing and take-off per day at the Port of Whitman Business Air Center. Other flight instructors, such as Dick Roberts out of Lewiston are known to occasionally use the Port of Whitman Business Air Center. The operations estimate has also been increased by 500 operations to include area flight school activity.

A forecast estimate of Total Operations is developed and summarized in Table 2-11 by assuming a reasonable value of 250 operations per based aircraft plus 2, 500 operations for the aerial spray operation plus the 500 operations from the flight school.



TABLE 2-11: TOTAL OPERATION FORECASTS (ASSUMING 250 OPS /BASED AIRCRAFT)

	2005		2010		2015		2020		2025	
	Based Aircraft	Total Ops	Based Aircraft	Total Ops	Based Aircraft	Total Ops	Based Aircraft	Total Ops	Based Aircraft	Total Ops
USKH*	20	8,000	21	8,250	23	8,750	25	9,250	28	10,000
2001 WSDOT Forecast	14	11,000	14	11,100	14	11,100	NA	NA	NA	NA
FAA Forecast (TAF)**	16	12,000	16	12,000	16	12,000	16	12,000	NA	NA

* Assumed 250 operations per based aircraft + 2,500 ops per aerial spray operation + 500 ops from area flight instructors.

**Forecast Issued January 2005.

NA Not Available.

The total operations forecast based the actual current based aircraft and assuming 250 operations per based aircraft results in a forecast that is 83% of the TAF for the 10 year (2015) forecast. The results of this forecast procedure fall outside the 15% tolerance requirements of the Aviation Forecast Guidance Memo. However, since this growth scenario takes into account local economic trends, incorporates actual registered aircraft counts and actual based aircraft counts, it should be more realistic than the current APO TAF Detail Report which estimates a static 16 based aircraft from 2000 through 2020. According to FAA, if local analysis is performed and found to be reasonable, the TAF can be updated and revised to reflect a more realistic forecast.

Busy Hour Operations

The number of busy hour operations at smaller non-towered general aviation airports is typically less than 20. This assumes that there is no extensive flight training activity (particularly touch and go operations) occurring at the airport.

In the 1990 Master Plan Update, W & H Pacific used a rule-of-thumb calculation based on the number of annual operations to estimate peak hour demands. Table 2-12 tabulates the results of this calculation for the next 20 year planning horizon and shows that the busy hour operations should remain less than 20.



TABLE 2-12: PEAK DEMAND FORECAST

Projected Operations					
Year of Operations	2005	2010	2015	2020	2025
Annual Operations	8,000	8,250	8,750	9,250	10,000
Peak Month (10% of Annual)	800	825	875	925	1,000
Average Day (Peak Month/31)	26	27	28	30	32
Busy Day (110% of Average Day)	28	29	31	33	35
Peak Hour (11% of Average Day)	3	3	3	3	4

The Based Aircraft and Operations forecast, based on a five-year Moscow/Pullman Regional Airport hangar moratorium, is summarized in Table 2-13. The itinerant operations, consisting of local flight school instruction flights, currently amount to approximately 5% of the total operations. As additional aircraft are based at the Port of Whitman Business Air Center, we assume the percentage of itinerant operations will increase to approximately 10% of total operations.



TABLE 2-13: BASED AIRCRAFT AND OPERATIONS FORECAST SUMMARY

	Projected				
	2005	2010	2015	2020	2025
Annual Aircraft Operations					
Aircraft Mix:					
Single Engine	7,200	7,465	7,990	8,100	8,600
Multi-Engine/Other	800	785	760	1,150	1,400
<i>Total</i>	8,000	8,250	8,750	9,250	10,000
Type of Operation					
Local	7,600	7,838	8,312	8,787	9,500
Itinerant	400	412	438	463	500
<i>Total</i>	8,000	8,250	8,750	9,250	10,000
Busy Hour Operations					
	<20	<20	<20	<20	<20
Based Aircraft					
Aircraft Types					
Single Engine	18	19	21	21	24
Multi-Engine	0	0	0	1	1
Turboprop/Business Jet	1	1	1	2	2
Helicopter	1	1	1	1	1
<i>Total</i>	20	21	23	25	28



3.0 AIRPORT FACILITY REQUIREMENTS

This section uses the inventory and forecast analyses presented in Section Two and established planning criteria to determine airside and landside facility requirements at Whitman Business Air Center. Airside facilities include runways, taxiways, navigational aids, and lighting systems. Landside facilities include hangars, fixed base operator (FBO) facilities, aircraft parking apron, agricultural aircraft facilities, aircraft fueling, automobile parking, utilities, and surface access. To plan for future needs, the forecast aviation demand must be translated into specific types and quantities of facilities that can adequately serve the identified demand.

The primary purpose of the ALP is to identify appropriate FAA-recommended design standards for facilities at the Port Whitman Business Air Center. The ALP also presents general recommendations that may be applied to existing facilities. Alternatives for providing these facility improvements are evaluated in Section Five, to assist in determining the most cost effective and efficient means for future improvements to the airport.

The previously approved 1992 Airport Master Plan (AMP) and ALP recommended several airfield improvements at Whitman Business Air Center for the 20-year schedule of 1990-2010. They are summarized in Table 3-1.

TABLE 3-1: SUMMARY OF PREVIOUS RECOMMENDED IMPROVEMENTS

Recommended Projects	Completed	Not Completed
Pave Runway Extensions		X
Pave Taxiway Extensions	Partial (Half)	
Pave Taxiway Connectors		X
Paint Runway Stripes	X	
Paint Runway Numerals	X	
Paint Runway Hold Lines	Partial (Half)	
Paint Runway Fog Lines		X
Paint Taxiway lines	Partial (Half)	
Re-locate Runway Threshold Lights to Correct Location (Off by approximately 50 feet from existing threshold)		X
Re-install/Add Runway Edge Lights		X
Install PAPI on Runway Ends		X
Install Reflective markers on Taxiways		X
Visitor Center		X
Parking Signs		X



Recommended Projects	Completed	Not Completed
Remove Pole at Taxiway Connector	X	
Install Airport Direction Signs		X
Construct Visitor and Based Aircraft Tie-Downs		X
Relocate Lighted Wind Indicator		X
Install Unlighted Wind Indicator in Apron Area		X
Develop Welcome Center	X	
Construct Heliport		X
Plan Apron Development		X

Previous AMP and ALP Capital Improvements

Source: TRA/W&H Pacific-1992 AMP and AIRSIDE 2001 Development Plan Draft Report

3.1 AIRPORT DESIGN STANDARDS

Planning for future improvements is based on the critical aircraft used at the airport. Identifying the critical aircraft anticipated to use the airport is important in determining the appropriate design standards. Critical aircraft is recognized as the most demanding aircraft operating at a minimum of 500 annual iterant operations. The most significant characteristics of critical aircraft are approach speeds and wingspans. Based on these characteristics, design standards determine horizontal and vertical distances between on and off-site airfield structures. The critical aircraft also determines the design standards selected for development of airfield facilities.

The Port of Whitman Business Air Center ALP update will implement design standards based on the recommendations identified in the FAA's AC 150/5300-13, Airport Design. These recommendations serve as the primary reference in planning airfield facilities. FAA's FAR Part 77, Objects Affecting Navigable Airspace, defines airport imaginary surfaces, which are established to protect the airspace immediately surrounding a runway and are discussed in Section 3.3 FAR Part 77 Surfaces. The airspace and ground areas surrounding a runway should be free of obstructions (i.e., structures, parked aircraft, trees, etc.) to the greatest extent possible.

Five categories based on aircraft approach speeds are identified in FAA Advisory Circular 150/5300-13. Categories A and B consist of aircraft with approach speeds of less than 121 knots. These categories include small propeller aircraft, some smaller business jet aircraft, and some larger aircraft. Categories C, D, and E consist of aircraft with approach speeds of 121 knots and more. These categories include business jets, larger jets, and propeller aircraft generally associated with commercial and military use. The advisory circular also establishes six aircraft design groups, based on the wingspan of the aircraft. These categories range from Airplane Design Group (ADG) I, for aircraft with wingspans of less than 49 feet, to ADG VI for the largest commercial and military aircraft.



The Port of Whitman Business Air Center is classified as a B-I Small airport. According to FAA's AC 150/5300-13, Airport Design, this type of airport generally serves single-engine and small twin aircraft exclusively, those used for personal and business purposes. This classification of airport is normally designed for aircraft in Aircraft Approach Category B, serving small airplanes with approach speeds up to but not including 121 knots; and Airplane Design Group 1, serving airplanes with wingspans up to but not including 49 feet. In addition, the existing runway is designed to serve small aircraft only with maximum certificated takeoff weight of 12,500 pounds or less. This is referred to as the Airport Reference Code (ARC) B-1 Small (B-I Small).

A summary of typical aircraft and their respective design information is presented in Table 3-2. The majority of these aircraft weigh less than 12,500 pounds and classified as small aircraft.

TABLE 3-2
TYPICAL AIRCRAFT & DESIGN CATEGORIES

Aircraft	Design Group	Approach Category	Maximum Gross Takeoff Weight (Lbs)
Cessna 172	A	I	2,500
Cessna 206	A	I	3,600
Beechcraft Bonanza A36	A	I	3,650
Beechcraft Baron 55	A	I	5,300
Grumman G-164A Ag-Cat	A	I	4,500
Piper Pawnee (PA-25, 235)	A	I	2,900
Cessna 340	B	I	5,990
Cessna 402	B	I	6,300
Cessna 421	B	I	7,450
Cessna Citation I	B	I	11,850
Grumman G-164B Ag-Cat	B	I	7,020
Piper Aerostar 602P	B	I	6,000
Beech King Air B200 (MED VAC)	B	II	12,500

Source: FAA Advisory Circular (AC) 150/5300-13 and Airliners.net



The critical aircraft in the previous ALP was a Cessna 421, with a total annual operations of 380 for 1987 and a projected annual operations of 760 for 2005. This aircraft has approach speeds of up to 96 knots and a wing span of 42 feet. With agricultural operations now located at the airport, the critical based aircraft has changed. The critical based aircraft, based on operations (as identified in Section 2.6 Socioeconomic Data) and design criteria, is the Grumman G-164 Ag-Cat, used for agricultural purposes. The larger model of this aircraft is classified as a B-I aircraft. These aircraft can obtain up to a total of 1,250 annual operations and have approach speeds of up to 113 knots and wingspan of up to 42' in length. Although the Beech King Air B200 aircraft (B-II) is identified on Table 3-2, operations for this aircraft on POWBAC are minimal and occur on emergency basis, as required. This aircraft has been seen to land approximately twice a year.

Based on current and forecasted activity, the use of ARC B-I Small is considered appropriate for use on Runway 07/25 at the Port of Whitman Business Air Center and suitable for future critical aircraft. Airfield design standards for ADG I are summarized in Table 3-3. A summary of the airport's current compliance with the design standards is also summarized in Table 3-4.



TABLE 3-3
AIRPORT DESIGN STANDARDS SUMMARY
(Dimensions in feet)

Description	Existing Dimensions ¹	ADG I Small ³ (small aircraft exclusively) Standard Dimensions
Runway Length	3,210' w/ displaced thresholds (Displaced 492' Rwy 07) (Displaced 320' Rwy 25) TORA 3,210' (R/W 7) 3,210' (R/W 25) TODA 3,210' (R/W 7) 3,210' (R/W 25) ASDA 3,210' (R/W 7) 3,210' (R/W 25) LDA 2,718' (R/W 7) 2,890' (R/W 25)	3,090' / 3,700'
Runway Width	55	60
Runway Shoulder Width	10	10
Runway Safety Area Width	120	120
Runway Safety Area Length (Beyond Rwy End)	240' (Rwy 07) / 240' (Rwy 25)	240
Obstacle-Free Zone	250	250
Object Free Area Width	250	250
Object Free Area Length (Beyond Runway End)	240' (Rwy 07) / 240' (Rwy 25)	240
Part 77 Primary Surface Width	250	250
Part 77 Primary Surface Length (Beyond Runway End)	200	200
Runway Protection Zone (RPZ) Length	1,000	1,000
Runway Protection Zone (RPZ) Inner Width	500 ²	250
Runway Protection Zone (RPZ) Outer Width	700 ²	450
Runway Centerline to Parallel Taxiway	200 to 230	150
Taxiway Width	25 / varies	25
Taxiway Shoulder Width	10	10
Taxiway Safety Area Width	49	49
Taxiway Object Free Area Width	89	89

Notes:

- Existing dimensions based on site inspection and data generated by Washington DOT Aviation 5010 Form.
- Dimensions obtained from previously approved ALP, dated 1992.
- FAR Part 77 criteria reflects visual runway; all other dimensions reflect ADG-1 Small visual runways with not lower than 3/4-statute mile approach visibility minimums (per AC 150/5300-13, Change 7). RPZ dimensions based on visual.



TABLE 3-4
SUMMARY OF POWBAC COMPLIANCE WITH FAA DESIGN STANDARDS
(EXISTING CONDITIONS)

Item	Do Existing Conditions Meet ADG I-Small ¹ Standards?	Comments / Controlling Feature
Runway Length	Yes	Per FAA Runway Length Model – 3,090 feet is recommended for 75% of small aircraft with less than 10 seats.
Runway Width	No	An average of 55 feet was identified in field survey.
Runway Safety Area (RSA)	No	Both ends of runway have drastic 1' drop off from edge. Both ends of runway have wheat cultivation. Runway edge lights protrude from ground. Can meet standards by grading area.
Runway Object Free Area (OFA)	Yes	N/A.
Runway Obstacle Free Zone (OFZ)	Yes	N/A
Runway Protection Zones (RPZ)	Yes	Roads at both ends of RPZ. However road on R/W 7 will be closed off. Road on R/W 25 conflicts minimally on departure RPZ. RPZ dimensions used on existing ALP were for B-1, not B-1 (small).
Runway-Parallel Taxiway Separation	Yes	The parallel taxiway also meets ADG-1 standards.
Taxiway Width	Yes	25 feet, However parallel taxiway is in very poor condition.
Taxiway Safety Area (TSA)	No	Parallel taxiway pavement surface is broken and in very poor condition.
Taxiway Object Free Area (TOFA)	Yes	N/A
Building Restriction Line	Yes	Existing Hangars are out of TOFA. However, some existing hangar concrete pads are with in the TOFA.
Aircraft Parking Line	No	There are some tie-downs that are with in the TSA.

Notes:

1. Runway design standards for approach category A&B visual runways and runways with not lower than ¾-statute mile approach visibility minimums.

3.2 DETAIL OF AIRPORT STANDARDS & EXISTING LAYOUT

This section provides further information on dimension, standards, and definitions identified on Tables 3-3 and 3-4. This section also discusses existing features related to the standard and identifies non-conforming issues. Recommendations on non-standard issues are addressed in Section 5 Airport Development Alternatives.



Airspace

The airport is located in a low-lying area between areas of rising terrain on all sides. In the immediate vicinity, the area surrounding the Port of Whitman Business Air Center consists of gently rolling hills that create significant terrain obstructions for the airport. Terrain obstructions exist beyond airport property within runway approaches, as discussed in “Airspace” portion of **Section 2.5**. The existing airspace surfaces are based on standards for utility runways (designed for small aircraft with approach speeds of 50 knots or more) and visual approaches.

Due to existing terrain obstructions within the runway approaches, displaced thresholds were established at both ends of the runway. The Runway 07 threshold is displaced 492 feet from the end of the runway. The Runway 25 threshold is displaced 320 feet from the end of the runway. These displaced thresholds, with the implementation of declared distances, avoid obstructions within the approach area and meet AC 150/5300, Appendix 2. This criteria provides alternative threshold siting requirements for runways with significant obstructions. It states “no object should penetrate a surface that starts at the threshold and at the elevation of runway centerline at the threshold sloping upwards from the threshold at a slope of 20 (horizontal) to 1 (vertical).” This surface extends 5,000 feet along the extended runway centerline at each threshold. By applying the obstacle clearance approach (OCA) criteria, penetrations within these approach surfaces are eliminated.

According to the State Aviation System Plan inventory database, provided by the Washington DOT Aviation Division, Runway 07 was identified to have a clear approach surface of 8:1 based on a gravel road located 316 feet from the runway end and 131 feet to the right of the runway centerline. Runway 25 was identified to have an approach surface of 33:1 based on a 115-foot hill located 4,000 feet from the runway end. Our field survey and data were used to analyze this information. Based on our field survey, both approaches are met using a 20:1 slope from the displaced thresholds on both runway ends to comply with obstacle clearance approaches.

Runway Approach Equipment

The Port of Whitman Business Air Center is not equipped with instrument approach equipment. The current condition of the airport accommodates visual approaches with 1-mile visibility minimums.

Runway Safety Area (RSA)

A RSA is defined per the FAA AC “as the surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.” The standard RSA for an ADG I-Small runway is 120 feet wide, centered along the runway centerline and extending 240 feet beyond each runway end. Based on the runway length of 3,210 feet, the RSA for Runway 07/25 should be 3,690 feet long by 120 feet



wide. Currently, the runway does not meet the recommended RSA dimensions due to ground depressions along both ends of the runway dropping off approximately 1-foot in elevation, runway edge lights protruding from the ground, and existing wheat fields.

Runway Object Free Area (OFA)

Runway object free areas (OFA) are areas provided to enhance the safety of aircraft operations by having the area free of objects above the runway safety area edge elevation, except for air navigation objects. Obstructions within the OFA may interfere with aircraft flight in the immediate vicinity of the runway. The standard OFA for ADG I (small) runways is 250 feet wide, centered along the runway centerline and extending 240 feet beyond each runway end. The dimensions for the OFA extending beyond the end of the runway are the same dimensions as the RSA. No apparent objects protrude from the RSA edge elevation in the OFA.

Runway Obstacle Free Zone (OFZ)

The OFZ is a plane of clear airspace extending vertically from the runway to a height of 150 feet above the established runway elevation, which coincides with the OFA and FAR Part 77 horizontal surface elevation. The airport complies with this standard for Runway 7/25.

Taxiway Safety Area (TSA)

This surface is similar to the RSA, however applied to the taxiway. This surface is intended to reduce risk of damage to an airplane unintentionally departing the taxiway. The standard taxiway safety area width for all ADG I aircraft is 49 feet, centered on the taxiway. The existing perpendicular taxiways comply with TSA standards. However, the existing parallel taxiway does not conform to the standards. Currently, approximately one third of this parallel taxiway is paved. The remaining length of this runway consists of gravel and poorly surfaced pavement. Aircraft cannot access the two thirds of this taxiway due to concern of damaging propellers, wheels, and the body of the aircraft.

Taxiway Object Free Area (TOFA)

The standard taxiway OFA for ADG I is 89 feet wide, centered on the taxiway. The TOFA complies with the standards.

Building Restriction Line (BRL)

This imaginary line identifies acceptable locations and heights for buildings on airports, based on the OFA/OFZ (125' from centerline of runway) and the transitional surface (7:1 beyond 125' from the centerline of runway), under the FAR Part 77 surfaces.

Currently, the closest building to the runway centerline is approximately 276 feet. Building, at this location, would require a structure height of no more than 21.5 feet. The proposed BRL for



structures are located 279 feet from runway centerline. This would require a structure height of no more than 22 feet at this location.

Runway Protection Zones (RPZ)

Runway protection zones (RPZ) are areas off the ends of the runway intended to enhance the protection of people and property on the ground. RPZs typically begin 200' beyond each runway end and coincide with the inner approach surfaces for runways. The RPZ restricts development within the RPZ boundary. RPZ's with buildings, parking areas, roadways, or other items do not comply with FAA standards. Due to displaced threshold conditions, RPZ's are established at each end of the runway for approach and departure conditions. Therefore, approach RPZ's are located 200' from the threshold and departure RPZ's are located 200' from the physical end of the runway (edge of pavement, including displaced threshold), and are dimensioned as identified in Table 3.3.

Portions of the existing RPZ for Runway 7/25, currently fall outside airport property and are not fenced or protected. To the west, Runway 7 RPZs is partially over adjacent property, used as a wheat field. The existing airport secondary access road, located on airport property, also intersects Runway 7 RPZ. This secondary access road will be closed in the near future by the Port of Whitman County, and will only serve as an emergency access road. Runway 25 departure RPZ overlies on a small area of the main airport access road, approximately 44 SY.

It is important to note that the previous ALP and the State Aviation System Plan inventory database identify the airport as a B-1 Small airport. However, both list the existing RPZ dimensions per a category B airport. Category B RPZ dimensions are much larger than a B Small category and consist of an area 1,000 feet in length, a 500-foot inner width, and a 700-foot outer width. Category B Small RPZ dimensions consist of an area of 1,000 feet in length, a 250-foot inner width, and a 450-foot outer width. This ALP continues to identify the airport as a B-1 Small airport and therefore refers to B-1 Small RPZ dimensions.

Aircraft Parking Line (APL)

The standard APL for ADG I-Small is 125 feet from runway centerline, although this distance would need to increase to meet parallel taxiway object free areas. Based on a standard parallel taxiway separation of 150 feet and a TOFA of 89' wide (44.5' from taxiway centerline), aircraft parking areas could be located a minimum of 194.5 feet from runway centerline (or 44.5' from the parallel taxiway.) The APL for this airfield complies with the standards.

Runway-Parallel Taxiway Separation

Runway 07/25 has a full-length parallel taxiway located on the south side of the runway. The taxiway meets the separation of a minimum of 125 feet between runway and taxiway centerlines. It also appears that the standard for B-I runway-parallel taxiway separation of 150 feet is met. Currently, the separation distance between runway and the parallel taxiway is 200 to 230 feet.



3.3 FAR PART 77 SURFACES

Federal Air Regulations (FAR) Part 77, Objects Affecting Navigable Airspace, examines objects affecting navigable airspace. FAR Part 77 defines an imaginary airspace surface surrounding an airport. These areas are established to protect the airspace immediately surrounding a runway. These areas assist aircraft approaches and are recommended to be kept clear of obstructions. The dimensions for the Part 77 surfaces will be depicted on the Airspace Plan drawing and should also be used to define airport overlay zoning. A utility runway is defined as “a runway that is constructed for and intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight and less.”

For airspace planning purposes, the use of utility runway standards with visual approach capabilities (per FAR Part 77) is appropriate for Runway 07/25. Table 3-5 summarizes FAR Part 77 standards with the corresponding runway type and approach capability. Refer to Sheets C1.2 and C1.3 Airport Airspace Plan Drawings for details.

TABLE 3-5
FAR PART 77 AIRSPACE SURFACES

Item	Utility/Visual ^{1, 2}
Width of Primary Surface	250'
Length of Primary Surface beyond Runway End	200'
Radius of Horizontal Surface	5,000'
Approach Surface Width at End	1,250'
Approach Surface Length	5,000'
Approach Slope	20:1

Notes:

1. Visibility minimums greater than $\frac{3}{4}$ mile; circling minima.
2. Utility runways are designed for aircraft weighing 12,500 pounds or less.

Primary Surface

The primary surface is a horizontal surface of airspace, longitudinally centered along the runway centerline. This surface lies on the runway and begins 200 feet from the runway end for utility airfields and is 250 feet in width. The primary surface should be free of any penetrations, except items with locations fixed by function (i.e., PAPI, edge lights, etc.). The primary surface end typically connects to the inner portion of the runway approach surface.



Transitional Surface

The transitional surface is located at the outer edge of the primary surface, represented by a plane of airspace that rises perpendicularly at a slope of 7:1, until reaching an elevation 150 feet above runway elevation. This surface should be free of obstructions. Four terrain areas appear to penetrate the transitional surface.

Horizontal Surface

The horizontal surface is a flat plane of airspace located 150 feet above the established airport elevation of 2330.88. (Airport elevation is 2180.88.)

The outer boundary of the Runway 07/25 horizontal surface is defined by two 5,000-foot radii, which extend from the runway ends (the intersection point of the extended runway centerline, the outer edge of primary surface, and the inner edge of the approach surface). The outer points of the radii for each runway are connected to form an oval, which is defined as the horizontal surface. The horizontal surface has several terrain obstructions.

Conical Surface

The conical surface is an outer band of airspace, which abuts the horizontal surface. The conical surface begins at the elevation of the horizontal surface and extends outward 4,000 feet at a slope of 20:1. The top elevation of the conical surface will be 200 feet above the horizontal surface and 350 feet above airport elevation. The conical surface also appears to have obstructions.

Approach Surface

The FAR Part 77 standard slope for utility runway approach surfaces is 20:1, 200 feet beyond the end of the runway. The inner edge of the approach surface connects to the primary surface and extends outward 5,000 feet. Runway approach surfaces extend outward and upward from each runway end, along the common arrival and departure path for aircraft. For Runway 07/25, the inner width of the approach surface is 250 feet and the outer width is 1,250 feet. Based on existing site terrain, unobstructed approach surfaces for FAR Part 77 cannot be achieved.

3.4 AIRSIDE REQUIREMENTS

Airside facilities are amenities directly pertaining to the arrival and departure of aircraft such as runways, taxiways, and airfield lighting and instrumentation.

Runways

The existing runway at POWBAC was analyzed to determine its adequacy. Items considered in the review included runway orientation, runway dimensions, and pavement quality and strength.



Runway Orientation

The orientation of Runway 7/25 was analyzed in the previous ALP. Takeoff and landing operations are primarily a function of wind velocity and direction, combined with the ability of an aircraft to operate under adverse wind conditions. The orientation of Runway 7-25 is in the east-west direction and appears to be inline with the prevailing winds. The orientation of this runway is assumed to remain and will not be further analyzed.

Runway Dimensions

Runway 07/25 has published dimensions of 3,209 by 60 feet (U.S. Government Airport/Facility Directory). However, our field survey verified a total length of 3,210 feet and a total width of 55 feet. The runway width is determined by the Airplane Design Group (ADG). The Port of Whitman Business Air Center is classified as an ADG-I and therefore has a recommended standard runway width of 60 feet. Runway length requirements are based primarily upon airport elevation, mean maximum daily temperature of the hottest month, runway gradient, and the critical aircraft type expected to use the runway.

Based on local conditions and the methodology outlined in AC 150/5325-4A/B, runway lengths can be derived for several fleet scenarios. A total runway length of 4,400 feet would be required to accommodate small airplanes with 10 or more seats. POWBAC does not experience this type of fleet, and therefore it would not be practical to apply this requirement to the airport. POWBAC experiences fleet that consists of small airplanes having less than 10 passenger seats. Analyzing this scenario, a total runway length of 4,300 feet would be required to accommodate 100% of small aircraft fleet (12,500 pounds or less maximum gross takeoff weight) having less than 10 passenger seats. A summary of FAA-recommended runway lengths serving small airplanes were derived, as listed below:

FAA Runway Lengths Recommended For Airport Design (From FAA Model):

Airport Elevation: 2,180.88 MSL

Mean Max Temperature in Hottest Month: 77.5 F

Maximum Difference in runway centerline elevation: 32 Feet

Current Runway Length: 3,210 feet

Small Airplanes with less than 10 seats

75% of these airplanes 3,090 feet AC 150/5325-4A

95% of these airplanes 3,700 feet AC 150/5325-4B

100% of these airplanes 4,300 feet AC 150/5325-4B

Small airplanes with 10 or more seats 4,400 feet AC 150/5325-4B



When displaced thresholds are considered, the available runway length for certain operations are reduced. As identified in Section 2.5, runway length for takeoff run available (TORA), takeoff distance available (TODA), accelerate-stop distance available (ASDA), and landing distance available (LDA) were identified from both runway ends and are summarized as follows:

	Runway 7	Runway 25
TORA	3,210'	3,210'
TODA	3,210'	3,210'
ASDA	3,210'	3,210'
LDA	2,718'	2,890'

With a total runway length of 3,210 feet, Runway 7/25 is capable of accommodating 79% of small aircraft fleet having less than 10 passenger seats. This condition would apply to the TORA, TODA, and ASDA. The LDA is reduced to 2,718' for approaches made on Runway 07 and 2,890' for approaches made on Runway 25. These lengths, therefore, accommodate 62% and 68% of small aircraft fleet having less than 10 passenger seats, respectively. Although these percentages are marginal, the existing runway length is able to accommodate most aircraft that use the airport on a regular basis, except during very high temperatures, when runway length requirements for some aircraft would increase. However, based on the selected design aircraft and projected activity, Runway 7/25 appears to be adequate to accommodate the majority of aircraft in the most common local weather conditions.

Airfield Pavement

The FAA-recommended weight bearing capacity for airfield pavements designed to accommodate light single-engine and twin-engine aircraft is 12,500 pounds with a single wheel landing gear. Runway 7/25 met this criterion when the runway was last paved.

All airfield pavements should undergo a regular routine of preventative maintenance including removal of vegetation growth through cracks and crack filling on an annual or semi-annual basis. The pavements should be seal coated (fog seal or slurry seal) about every five to seven years depending on rate of wear, local weather conditions, etc. General aviation runways, taxiways, and apron pavements normally require an asphalt overlay every fifteen to twenty years, depending on section design and level of use.

Based on the historic deterioration of airfield pavement at the Port of Whitman Business Air Center and the method used in the recent paving, it is anticipated that all airfield pavements will require an overlay or reconstruction during the current twenty-year planning period.



Airfield Capacity

The hourly capacity of Runway 07/25 is approximately 10 operations during visual flight rules (VFR) conditions. Based on forecast operations, the runway will continue to operate below capacity during the twenty-year planning period and well beyond.

Taxiways

The standard ADG I (small airplanes exclusively) runway-parallel taxiway separation is 150 feet. Runway 07/25 is served by a full-length parallel taxiway. This taxiway consists of partially paved and gravel surfaces. Approximately 2/3 of this taxiway is in poor condition. This taxiway is also not aligned consistently with the runway.

Airfield Instrumentation and Lighting

Runway 07/25 has medium-intensity runway edge lighting (MIRL). The system is listed as “nonstandard” due to the method of installation. The light cans were installed over the conduit and sit above grade.

The aircraft apron and hangar areas have limited flood lighting. Flood lighting is recommended for all operations areas for improved utilization and security. However, the current floodlights installed at the airport require shields to minimize illumination distribution to aircraft, highway traffic and adjacent rural neighbors.

Airfield Signing

Runway, taxiway, and informational signage does not presently exist at the airport. Signage increases operational flexibility and safety, and reduces liability for the airport.

3.5 LANDSIDE FACILITIES

The purpose of this section is to determine the space requirements during the planning period for the following types of facilities normally associated with general aviation operations areas such as hangars, aircraft parking and tie-down aprons, surface access requirements, and agricultural aircraft facilities.

Hangars

Land is available for hangar and tie down construction on the south side of the taxiway. Currently, six hangars are located on the airport and two are located south of the airport at the Colfax Industrial Park. The hangars located at the industrial park are currently occupied and do not use the airport. It is expected that the level of hangar utilization at the airport will increase, as discussed in Section 2.0. As many as 8 additional aircraft are expected to be based at the airport by 2025. A combination of hangars and/or tie-downs can accommodate this increase.



Aircraft Parking Apron

Parking for local and itinerant aircraft is provided on the existing aircraft apron located near the south side of the runway. However, the parking area is limited. We recommend installing tie-downs at the location of the future hangars until the hangars are installed. This will accommodate future needs for aircraft parking up to 2025.

FAA Advisory Circular 150/5300-13 suggests a methodology by which itinerant parking requirements can be determined from knowledge of busy-day operations. At Whitman Business Air Center, the number of itinerant spaces required was determined to be approximately 30% of busy day itinerant operations. The FAA planning criterion of 360 square yards per itinerant aircraft was applied to the number itinerant spaces to determine future itinerant ramp requirements. Locally based aircraft tie-downs are planned at 300 square yards per position. The aircraft parking area requirements are summarized in Table 3-6. Apron reserves should also be identified to accommodate unanticipated needs, and any needs beyond the current planning period.

Agricultural Aircraft Facilities

The existing agricultural (AG) aircraft facilities at the airport are located at one of the hangars on airport property. AG aircraft loading, fueling and other ground servicing occurs in this area as well as on one of the taxiway connectors.

The airport does not currently have a common use loading/rinse facility for agricultural aerial applicators. A separate AG loading area is recommended to avoid loading on the taxiway. A spill prevention plan is also recommended to address procedures and environmental issues during operations.



**TABLE 3-6
APRON AND HANGAR
FACILITY REQUIREMENTS SUMMARY**

Item	Base Year (2005)	2010	2015	2020	2025
Demand					
Based Aircraft	20	21	23	25	28
Itinerant GA Peak Day Aircraft ¹	1	1	1	2	2
Existing Facilities					
Light Aircraft Tiedowns ²	6				
Business Aircraft Parking Spaces ³	0				
Existing Hangar Spaces ⁴	11				
Total Apron Area	485 SY				
Projected Needs					
Locally-Based Tiedown Needs (@ 300 sy each)	3 spaces/ 900 SY	3 spaces/ 900 SY	2 spaces/ 600 SY	3 spaces/ 900 SY	2 spaces/ 600 SY
Itinerant Aircraft Parking (@ 360 sy each)	3 spaces/ 1,080 SY	2 spaces/ 720 SY	2 spaces/ 720 SY	3 spaces/ 1,080 SY	3 spaces/ 1,080 SY
Total Apron Needs	1,980 SY	1,620 SY	1,320 SY	1,980 SY	1,680 SY
Additional Hangar Spaces (@ 1,600 sf per 2 spaces)	0	4 spaces/ 3,200 SY	2 spaces/ 1,600 SY	2 spaces/ 1,600 SY	2 spaces/ 1,600 SY

1. Assumes 5% itinerant aircraft operations of average peak demand under Table 2-12.
2. 3 existing tie-downs are located within OFA.
3. Limited parking for itinerant aircraft is located on apron, north of hangar 3.
4. Estimate of existing hangar spaces and square footage; some buildings used primarily for equipment storage.



3.6 SUPPORT FACILITIES

Terminal Area Facilities

A portion of a hangar currently accommodates a restroom, telephone, and pilot waiting area, etc.

Aviation Fuel Storage

Aviation gasoline (AVGAS) is available at Whitman Business Air Center at one of the hangars, from a 100LL fuel container. However a fuel station does not currently exist. Due to the anticipated increase in based aircraft, the airport would benefit from a future fuel kiosk card lock facility.

Airport Utilities

Water, sewer, natural gas, electrical, and telephone service lines are located in close proximity to the airport. Fiber optic cable is available and located adjacent to the airport. Extension of water and electrical power to potential airport tenants should not require lengthy extensions of utilities. Overhead electrical lines should be buried whenever possible; new electrical connections to hangars or other airfield developments should also be placed underground.

Security

The airport does not have fencing around the airport.

Flood lighting should be provided around the aircraft parking apron, fueling, and hangar areas to maintain adequate security.



4.0 LAND USE/ZONING ASSESSMENT

Zoning & Land Use

Existing land use and zoning conditions and issues associated with the Port of Whitman Business Air Center are described in this section. Addressing the underlying land use and zoning issues is an important part of the Port of Whitman County long-term planning for the airport and the community in general.

The Port of Whitman Business Air Center is a general aviation airport located three miles southwest of Colfax. State Highway 26 and Sommers Road border the airport on the northwest and northeast, respectively. The airport is located in the unincorporated area of Whitman County and is zoned Heavy Industrial. The ALP drawing Sheet C1-8 shows the existing land uses on and off airport property. Consistent with the rural nature of Whitman County, the predominant existing land uses surrounding the airport are zoned Agricultural. Wheat fields surround the airport on all sides, along with direct access by State Highway 26. The adjacent property to the west includes the Whitman County maintenance shop. Other areas nearby include grain elevators and residential housing. Existing airport land uses consist of aircraft operations (runway, taxiway, and apron), aviation-related uses (County and private hangars), and open space (north of the runway and south of the existing buildings). The area immediately south of the existing private hangars, also owned by the Port of Whitman County, has been designated as the Colfax Industrial Park for future aviation-related uses.

Pending Zoning/Land Use Issues

Based on current conditions and information obtained, the basis for these recommendations remains valid and should be incorporated into the updated ALP. See specific updated land use recommendations below:

- Currently under the Whitman County Zoning Code, Chapter 19.31 Heavy Industrial District allows uses for transportation providers, such as motor vehicles freight-lines and similar uses. It also permits such uses as storage facilities, sales of agricultural services, concrete and asphalt plants, laboratories, warehouses, retail services, and other similar uses. Aeronautical use is not specifically identified. However, it is not stated as a restricted use. We recommend the Port of Whitman County coordinate with Whitman County to specifically identify aeronautical/aviation use within this zone or to rezone POWBAC as an Airport Commercial District, per Chapter 19.21. Refer to Appendix 5 for the Whitman County Zoning Code. It is also recommended the Port of Whitman County make every effort possible, to comply with Compatible Land Use per Grant Assurance 21. This assurance states the sponsor "...will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes



compatible with normal airport operations, including landing and takeoff of aircraft.” Refer to Appendix 3 for the FAA 1999 Planning Agency Sponsors Assurances.

- The Port of Whitman County has not established a Comprehensive Plan including POWBAC. In reviewing the Port of Whitman County 2000 Comprehensive Plan, airports are recognized as a form of transportation and addressed in the general section of Washington Ports in the Preface. However, the only other reference of airports in the comprehensive plan is under the Transportation Goal, in which the Moscow-Pullman Airport is addressed. The Colfax Industrial Park is mentioned, but lacks the connection with POWBAC and aviation usage. Revising the Port of Whitman County Comprehensive Plan to include POWBAC as an airport is recommended. We also recommend identifying its goals, 20-year plan per the ALP and reference to the ALP, including the airspace plan, to the comprehensive plan. Refer to Appendix 4 for the Port of Whitman County 2000 Comprehensive Plan.
- Since the POWBAC is owned by the Port of Whitman County, coordination is required with Whitman County to update the county’s Airport Overlay Zone (Chapter 19.51 Airport Landing Zone Overlay District) for the airport. Currently, Whitman County implements the Airport Overlay Zone from 1948. In discussing the zoning and land use issues, the county addressed the concern of having the overlay be updated. The Airport Overlay Zone would identify and define imaginary airspace surfaces which comply to the FAA’s Federal Air Regulations (FAR) Part 77–Objects Affecting Navigable Airspace, including the approach, horizontal, transitional, and conical surfaces. This ordinance would also establish height limitations for each zone, identify current obstructions within this area, and show portions of the airport’s imaginary airspace surfaces extending beyond the Port of Whitman County land use jurisdiction. The ordinance is not intended to be retroactive. However, the ordinance would distinguish between existing and future uses. It is recommended that the Port of Whitman County and Whitman County planning departments coordinate the current and future uses of POWBAC. The implementation of the updated overlay zone is recommended to ensure safety of the airspace, prevent obstruction of future development, and to assist in identifying areas that require airspace easements.
- It is also recommended that the Port of Whitman County and the Whitman County Planning Department coordinate future projects that lie within and adjacent to the airport with the Whitman County Overlay Zone and all appropriate entities, including WSDOT Aviation Division and FAA. Upon request, the Washington State Department of Transportation Aviation Division (airport encroachment program) assist local airport



- sponsors and land use planning jurisdictions address land use and development issues, which affect airports.
- It is also recommended that the Port of Whitman County work with Whitman County to implement a procedure prior to issuing building or construction permits, adjacent or within the Overlay Zone. Form 7460 is required in certain areas adjacent to the airport and for all structures exceeding 200', including antennas or towers.
 - The previous 1992 "Exhibit A" drawing considered the original airport land of 144.1 acres from Parcels A (114.71 acres) and B (29.39 acres). Refer to Appendix 2. Since the 1992 ALP, portions of Parcel A were transferred (Colfax Industrial Park), 1997 (Matark), and 2002 (Airport), as stated in Section 2.3 Airport History. Throughout these transfers and acquisitions, several discrepancies with property boundary/legal descriptions were identified. Most recently, FAA and the Port of Whitman County negotiated a portion of the Colfax Industrial Park (Lots 11 –17) to be transferred back to the airport.

The updated "Exhibit A" incorporates these land transfers to the best extent possible. The deeds from the original airport property (144.1 acres), deeds from the transfers, and the deed for the Final Plat of the Colfax Industrial Park have all been reviewed and used to create an airport boundary and legal description. The Colfax Industrial Park Final Plat, created by HEDCO and Munir Daud & Associates, was used for internal lot layouts and to identify the Port of Whitman Business Air Center and the Colfax Industrial Park boundaries. Refer to the updated "Exhibit A" drawing for current land ownership.

Due to inaccuracies created during the airport property transfers and acquisitions in 1993, 1997, and in 2002, an accurate legal description is not currently available for all parcels. For example, when the far west area of Parcel A was transferred to Matark in 1997, the legal description was based on topographic features and not true distances and bearings. Therefore, some areas have only approximate acreage established. We recommend that the Port of Whitman County complete a true boundary survey and reconcile the remaining property inaccuracies. A draft legal description has been created using all available information referenced above. This draft legal description is used for "Exhibit A.



5.0 AIRPORT DEVELOPMENT

This section reviews and presents options for the future facility needs identified in the previous section. Based on the forecast of aviation activity and analysis of airport facility requirements, it is evident that maintaining existing facilities and a phased expansion of demand-driven facilities (such as rehabilitating the taxiway, constructing aircraft parking, hangars, fuel station, visitor center, etc.) will help the Port of Whitman County Business Air Center serve aviation needs in the area through the 20-year planning period. Airport facilities, such as a visitor center with a public restroom and telephone, etc. will also be a positive benefit for airport users as well as the overall community.

Airport Development Alternatives

The following development alternatives are based on the current and future needs of the airport. Costs associated with developing these improvements are also discussed. A detailed cost estimate for the preferred alternative in the 20-year Capital Improvement Program (CIP) is provided in Table 6-2 in Section Six. This table identifies the schedule for each improvement based on needs and finances anticipated.

During group discussions with the Port of Whitman County staff and the Airport Advisory Board, decisions were made that assisted in the formulation of the alternatives presented here. For example, property lines were better defined for the POWBAC and the Colfax Industrial Park. A decision was also made to not consider acquiring adjacent property for future improvements, with exception of property needed for RPZ areas.

The previous ALP and Airport Master Plan for the 1990-2010 20-year planning period, the 2000 Development Plan, and the FAA ACs were also used to assess the future airport needs and airport alternatives. Refer to Table 3-1- Section Three for a summary of previously recommended improvements. Table 3-4, also in Section Three, identifies deficiencies with the current airport.



5.1 PREFERRED ALTERNATIVE – OPTION 1

The following is the preferred development alternative for the Port of Whitman Business Air Center. Section Two identified the existing and future forecasts for the next twenty years. Based on anticipated based aircraft and forecast, the airport needs space for aircraft and vehicle parking improvements. This alternative maintains the overall existing configuration of the airport, with the exception of the taxiway alignment. This alternative focuses on expanding the airport by maximizing the use of the existing area to its fullest potential to meet the current and future needs of the airport. This alternative is phased, due to funding, and identified in the Section 6.0 Capital Improvements Table 6.2.

The following Airport Development Alternatives are recommended for the Preferred Alternative:

Airport Reference Code

Based on the anticipated forecast, the airport should maintain the Airport Reference Code of B-1 Small (ARC B-I Small). The forecasts anticipate an increase only in based aircraft (A-I and B-I Small) with a gross takeoff weight of 12,500 pounds or less and, therefore, do not necessitate implementation of an ARC B-1 or larger airport. The Airport should continue to serve aircraft that bracket Approach Category B and Airplane Design Group I Small (ADG I - small). Approach Category B consists of aircraft with speeds of 91 knots or more but less than 121 knots. ADG I-small consists of aircraft with wingspans less than 49 feet and a single wheel weight bearing capacity of 12,500 pounds. By maintaining the current ARC, dimensions and design criteria recommended by FAA are minimized. For example, the separation distances for a runway and parallel taxiway for B-I Small and B-I are 150 and 225 feet (centerline to centerline), respectively.

Airspace

Implementing airspace use is critical for the safety of the aircraft and people surrounding the airport. Obstructions within the Obstacle Clearance Approach (OCA) and Part 77 are considered significant. In cases where obstructions (i.e. roads, structures, terrain, etc.) cannot be removed or relocated, FAA recommends reducing useable runway length to extent needed to meet the safety standards. At POWBAC, Runway 7/25 has displaced thresholds to accommodate obstacle clearance approaches. The existing displaced thresholds continue to meet OCA criteria and are therefore are recommended to remain in their existing condition.

Approximately 57 terrain obstructions exist with in the Part 77 airspace surface of the existing runway configuration. The majority of these terrain obstructions lie within the horizontal and conical surfaces of Part 77 airspace. Existing Part 77 obstructions are noted in the ALP drawings. Navigation easements should be considered for Part 77 airspace.



Runway & Airfield Improvements

Currently, the runway width is approximately 55 feet in width and in fairly good condition. We recommend the runway remain in its existing configuration and location, until the life of the pavement warrants new asphalt pavement. At such time, we recommend the runway be widened and paved to 60 feet in width, to meet FAA standards. We also recommend the runway length remain at 3,210 feet. The projected fleet expected to use the airport continues to mimic the current fleet. Critical aircraft, based on operations and design criteria, also continues to remain the same, as POWBAC serves the agricultural community. Based on these forecasts, aircraft that use this runway meet the currently landing distances available. However, if at such time the airport changes critical aircraft, lengthening from Runway 25 is recommended, due to limited available area. The lengthening on Runway 25 could only be used for approach landings from Runway 07, to increase the LDA for Runway 07. The location of the displaced thresholds should remain in their existing location to meet obstacle clearance approaches.

Both ends of Runway 7/25 require grading to achieve a uniform surface, to comply with RSA standards. In addition to grading within the RSA, runway light base require work to comply with runway safety area standards. (Refer to the Lighting Improvements section, listed below.) Agricultural and natural vegetation should also be cleared in the RSA, OFA, and RPZ areas. Easements or land acquisitions should be considered for the RPZ areas, outside airport property.

Taxiway Improvements

Taxiway A should be improved and realigned 150 feet (centerline to centerline) from Runway 7/25 to accommodate B-I Small aircraft. Approximately two-thirds of Taxiway A (parallel taxiway) requires extensive structural improvements to the existing taxiway section, located 200 to 230 feet (centerline to centerline) from the runway. Relocating the taxiway 150 feet from the runway would require that the full-length of the runway structural section be improved, and would allow more area to be used for aircraft and vehicle parking for future improvements.

Currently, the taxiway OFA borders the existing hangars and limits development. Providing as much apron space as possible is essential to meet future forecasts and development. Relocating the taxiway would provide approximately 50 to 70 feet of additional separation and would accommodate future recommended improvements such as apron, hangar, vehicle parking, visitor center, agricultural loading area, and room for a heliport. The realignment of Taxiway A is vital to the future development and economic growth at POWBAC. It is therefore considered a major improvement.

Lighting Improvements

Runway edge lighting should be corrected and/or installed. The majority of existing runway light base cans protrude from the ground and rest directly on top of conduit. These base cans and conduit should be reset to meet the runway safety area standards. Threshold lights should also be



relocated to comply with location requirements. Once the taxiway realignment improvements are made, we recommend the installation of MITL taxiway edge lights.

Marking Improvements

Currently, the runway is marked with runway identification numbers, centerline, displaced thresholds, and three out of the five connecting taxiways have lead-in lines on the runway. Three out of the five connecting taxiways have only hold position markings. The remaining markings for a visual runway should be completed. Taxiway markings should also be completed. Runway hold lines, runway fog lines, and taxiway centerline markings are recommended.

Signage

Airfield signs, such as runway distance remaining signs, and vehicle signs should be installed to provide safety. Signage would assist aircraft, vehicles, and people, informing them about the airport's configuration and circulation.

NAVAID Improvements

Navigational improvements should be implemented such as relocating the lighted wind cone, installing a Precision Approach Path Indicator (PAPI) System and potentially adding a Global Positioning System (GPS).

- The lighted wind cone is currently located between the runway and taxiway, approximately 17 feet from the edge of the Taxiway A. The lighted wind cone should be located north of the runway, 500 feet east or west of one of the runway threshold markings. An additional wind cone can be installed on the other side of the runway.
- Due to challenging terrain, displaced thresholds exist for Runway 7/25. Installing a PAPI system would benefit and assist aircraft approaching the runway. PAPI systems assist pilots approaching the runway by providing visual glide slope information. This information is transmitted by a signal of red and white beams of light indicating to the pilot whether the aircraft is above, below, or on the glide path.
- GPS is an additional navigational aid for pilots approaching an airport. GPS allows pilots to navigate to any airport in the country and not require the use of a specific navigational facility. GPS satellites in orbit around the earth transmit electronic signals, which properly equipped aircraft use to determine altitude, speed, and position. GPS provides many benefits to pilots as well as to airports. They include safer flights, accurate navigation based on a standardized navigation service and common avionics equipment, and more efficient and adaptable routes. Using GPS as a navigation aid also reduces separation minimums, which result in high capacities of based and itinerant air traffic. For this reason, airports and pilots throughout the world are using satellite navigation to



overcome many of the challenges in today's air traffic infrastructure. Over the next 20 years, FAA is gradually replacing all traditional navigational aids with GPS.

Although POWBAC does not have high volumes of based or itinerant aircraft, this system would allow a more organized air traffic pattern. This system would be most beneficial in assisting aircraft with the challenging terrain during arrival and departure approaches. However, due to this surrounding terrain, GPS may possibly only provide circling approaches. This system would still be a benefit to POWBAC. We recommend that a study to evaluate the approach slopes necessary for this system to be implemented be performed.

Aircraft Apron Improvements

Additional apron space should be constructed to accommodate aircraft tie-downs, aircraft hangars, and vehicle parking. Existing tie-downs should be removed and replaced in appropriate designated areas, out of existing safety areas. Tie-downs should also be installed in future hangar spaces until hangars are constructed. This will meet the forecast needs of future based aircraft predicted for POWBAC.

Fuel Services

The existing 100LL fuel system should be replaced with a self-serve fuel kiosk card lock system. The Port of Whitman County and the airport advisory board have indicated an existing above storage fuel tank with a card locking system is available to the airport and can be used for this improvement. Prior to the installation of this tank, we recommend that a containment cell and a spill prevention plan (SPCC) be established.

Agricultural Services

The airport is not equipped to handle agricultural loading. This process currently takes place at the end of Runway 25 and on Taxiway E (90' wide perpendicular taxiway). We recommend a permanent location be established to provide this service. In addition, we recommend an environmental spill prevention control plan be developed to implement appropriate operations and procedures.

Visitor Center

A visitor/information center should be constructed to accommodate visitors flying into the airport. This center would provide information about aircraft and vehicle visitor parking; local lodging, transportation, and recreational opportunities; and history and general material about POWBAC, the Colfax Industrial Park, and Colfax. Maps, telephone, restroom and a table would also be provided.



Helicopter Parking

A helicopter parking area should be constructed. The airport, on occasion, provides a secondary landing spot for the hospital when the hospital is constrained due to weather. However, when helicopters land, the runway is used as a parking location due to minimal parking on the airfield. This practice is not recommended due to possible oncoming aircraft approaching the runway. We recommend POWBAC establish a helicopter parking area, according to AC 150/5390-2B, to meet this need and create a safer landing area for approaching aircraft.

Pavement Maintenance

In addition to these improvements, a pavement maintenance program should be implemented to maximize the life of pavement use and optimize life cycle maintenance expenditures. The airport should participate in all available airfield pavement maintenance programs funded by WSDOT Aviation and FAA.

5.2 ALTERNATIVE - OPTION 2

This alternative includes improvements similar to those in Option 1. However, this option does not relocate the taxiway. The west one-third portion of Taxiway A would remain approximately 225 feet (centerline to centerline) from Runway 7/25 to accommodate B-I Small aircraft. The remaining two-thirds of Taxiway A would require extensive structural improvements to the existing taxiway section. This option would limit the buildable area for future improvements/expansion of aircraft and vehicle parking. Aircraft and tiedown capacity would be limited by approximately 50% and would not handle the anticipated forecast for the airport.

5.3 MISCELLANEOUS CONSIDERATIONS

Rates for airport uses should be established to accommodate future uses.

The Port of Whitman County should continue to support local volunteer efforts to maintain airport facilities.

Preferred alternatives, as identified with the Airport Committee Board, are incorporated into the ALP drawings in Section 8. As noted earlier, refined development costs associated with the preferred alternative are included as part of the 20-year Capital Improvement Program for the airport.



6.0 CAPITAL IMPROVEMENT PROGRAM (CIP)

Financial Management and Development Program

The analyses in the previous sections evaluated airport development needs based on forecast changes in aircraft activity for the next twenty-year period. Other factors evaluated in the analyses are operational safety and efficiency, environmental issues, and federal recommended criteria. One of the most important elements of the master planning process is the application of basic economics. Establishing a financial foundation and justification is critical to assuring the feasibility of the recommended improvements.

In recent years, major capital projects at the airport have been funded through WSDOT Aviation Division funds. Due to policy changes, WSDOT Aviation Division now requires NPIAS airports to first seek federal funding for improvements. As POWBAC falls under the NPIAS classification, the airport's primary source of funding will be through federal funding for eligible projects in the future.

Airport Development Schedule and Cost Estimates

The analyses in Section Five describe the airport's overall development needs for the next twenty years. However, for subsequent feasibility analyses, details need to be included for these capital expenditures. This has been accomplished by applying estimates of cost for projects within the development program. Cost estimates for each project are based on year-2006 dollars. A 30% contingency overhead for engineering, administration, and unforeseen circumstances has been included in the estimated component and total costs. In future years, as the plan is carried out, these cost estimates can continue to assist management by adjusting the 2006-based figures for subsequent inflation.

This may be accomplished by converting the interim change in the United States Consumer Price Index (USCPI) into a multiplier ratio through the following formula:

$$\frac{X}{I} = Y$$

Where:

X = USCPI in any given future year,

Y = Change Ratio,

I = Current Index (USCPI)

USCPI
201.7
(1982-84 = 100)
January 2006



Multiplying the change ratio (Y) times any 2006-based cost figures presented in this study will yield the adjusted dollar amounts appropriate in any future year evaluation.

Many smaller airports have a difficult time funding maintenance and capital improvements solely from airport-generated revenue sources. Local transportation or economic development funding is often needed to maintain the facilities. A periodic review of airport-related rates and fees is recommended. Rates can be adjusted as necessary to reflect real market conditions and actual costs. The Port of Whitman County does understand it be necessary for airport users to pay their fair share of the cost of maintaining and improving the facility before outside funds are sought. However, due to the limited revenue base at the Port of Whitman Business Air Center, an increase in airport-generated revenue is not likely to meet local funding needs, although it represents an important first step. Currently, the Port of Whitman County subsidizes most of the airport costs.

Typical Small Airport Generated Revenue Sources:

- Land Leases (hangars and other on-airport buildings)
- Aircraft Tiedown Fees (local and itinerant aircraft)
- Fuel Flowage Fees (local fees charged for fuel pumped on the airport)
- The Colfax Industrial Park, located to the south of the airport, was originally thought to be the location of potential through-the-fence operations if POWBAC could establish a rate and agreement to generate additional revenue. Unfortunately, the Port of Whitman County did not find this to be feasible. This Port of Whitman County has decided to sell the industrial park due to its lack of potential to generate additional revenue.

A few of the airport improvement projects identified in the ALP Report are presently not eligible for federal funding, although FAA non primary entitlement funds may be available for hangar and fuel improvements. Typically FAA issues these funds once all airside facility requirements have been met. State funds for these improvements are on a case-by-case basis, and only for fuel stations. The state allows airports to receive funds in cases where they see the need due to remote and/or strategic locations. Development at the airport may include hangar construction; aircraft fuel facilities; and other user-sponsored projects, such as a visitor welcome center, and the visitor vehicle parking area identified in this ALP update.



6.1 FINANCING OF DEVELOPMENT PROGRAM

State Funding

As noted earlier, the Washington Department of Transportation, Aviation Division has historically provided the majority of outside funding assistance to the airport for airfield improvement projects. The projects have significantly improved airfield safety and the Port is encouraged to continue working with the Aviation Division in seeking funding options for future project needs. As mentioned earlier, recent changes in state funding policy have necessitated that the airport sponsor also consider federal financial resources for airports that are classified as NPIAS. Although the level of state funding available for NPIAS airports for the Port of Whitman Business Air Center will be significantly reduced, WSDOT Aviation Division has programs, such as the airfield pavement maintenance and safety education programs, that may be available to provide some financial assistance.

Federal Grants

A primary source of potential funding identified in this plan is the Federal Airport Improvement Program (AIP). As proposed, approximately 95% of the airport's 20-year CIP will be eligible for federal funding. Funds from this program are derived from the Aviation Trust Fund, which is the depository for all federal aviation taxes collected on such items as airline tickets, aviation fuel, lubricants, tires, aircraft registrations, and other aviation-related fees. These funds are distributed under appropriations set by Congress to all airports in the United States that have certified eligibility. The funds are distributed through grants administered by the Federal Aviation Administration (FAA).

Under current guidelines, the airport sponsor receives 95% participation on eligible projects. According to FAA guidelines, Whitman Business Air Center will be eligible under the Airport Improvement Program (AIP) to receive discretionary grants and non-primary (general aviation) entitlement grants. Under the current authorization, small airports may receive up to \$150,000 per year in the general aviation (GA) entitlement grants. The Whitman Business Air Center is currently included in the AIP program. FAA and local approval of the updated ALP drawings and Narrative report, followed by a local request for various grants from the FAA to fund the outlined program will allow consideration and qualification for FAA project funding in future years.

The future availability of the GA entitlement funding is unknown and dependent on congressional reauthorization. However, based on current legislation, these grants have become a very significant source of FAA funding for general aviation airports.



Airport Layout Plan Report

Capital Improvement Program

The constraints of AIP funding and local match availability will dictate in large part, the actual schedule for completing airport improvement projects through the planning period. As a result, some projects included in the twenty-year CIP may need to be deferred beyond the twenty-year time frame. However, federal grants are expected to continue playing a significant role in the financing of the airport's projected capital expenditures. Table 6-1 identifies the Federal contribution for the next three years.

TABLE 6-1 NON PRIMARY ENTITLEMENT FUNDING

Year	Description	Unit	Total Units	95% Federal/AIP Share	2.5% WSDOT Share	2.5% Local ¹ Share	Total Cost ¹
2003 - 2005	Based on FAA Funding Allowance	Lump Sum	1	\$421,000 ²	\$10,525	\$10,525	\$442,050
2006	Based on FAA Funding Allowance	Lump Sum	1	\$150,000	\$3,750	\$3,750	\$157,500
2007	Based on FAA Funding Allowance	Lump Sum	1	\$150,000	\$3,750	\$3,750	\$157,500
Subtotals				\$721,000	\$18,025	\$18,025	\$757,050

NOTE:

1. If individual project exceeds annual entitlement under AIP, discretionary or other funds are required.
2. A total of \$127,000 must be used by FY 2006

Financing the Local Share of Capital Improvements

Perhaps the most significant challenge in financing the local share of capital improvements is associated with the need to provide a minimum 2.5% match for available funds. As funding options change, it will become increasingly important for the Port of Whitman County to ensure that a reliable funding mechanism exists to provide adequate resources to leverage capital improvement dollars. The existing airfield facilities are in fair condition with improvements needed for the apron and other safety related issues. Over time, all of the airport facilities will begin to deteriorate and will require investment to both prolong their useful lives and to eventually replace some of the facilities.

The evaluation of local financing options should work toward the goal of generating income each year to “match” anticipated GA entitlement funds. Major projects such as runway or taxiway reconstruction will likely require larger discretionary grants periodically, which also have a minimum 2.5% local match requirement.



6.2 RECOMMENDED PROJECTS

This section outlines the recommended development program and detailed funding distribution assumptions. The scheduling has been prepared according to the facility requirements determined earlier and overall economic feasibility. The staging of development projects is based upon projected airport activity levels and safety concerns. Actual activity levels may vary from projected levels. Therefore, the staging of development in this section should be viewed as a general guide. When activity varies from projected levels, implementation of development projects should occur when demand warrants, rather than according to the estimated staging presented in this section. In addition to major development projects, the airport will require regular facility maintenance.

A summary of development costs for the twenty-year CIP is presented in Table 6.2. The table provides a listing of the major capital projects included in the twenty-year CIP, including each project's eligibility for FAA funding.

Short Term Projects

The short-term phase of the capital improvement program includes the highest priority projects to be conducted during the first five years. The projects recommended for the next five years consist of RSA improvements, reconstructing Taxiway A, lighting improvements, installing navigational aids (PAPI), constructing aircraft tiedown and hangar spaces, constructing vehicle parking, and the installation of a self serving fuel kiosk with a card lock system.

Long Term Projects

Long-term projects are expected to occur beyond the next five years, although changes in demand or other conditions could accelerate or slow demand for some improvements. The long-term projects consist of signage improvements, constructing a visitor/information center, constructing a heliport, and implementing an additional navigational aid (GPS).

Minor pavement maintenance items are not included in the capital improvement program, but will need to be undertaken by the Port on a regularly scheduled basis. The recommended maintenance of airfield pavements ranges from very minor items such as crack filling to fog seals or patching. This program is intended to preserve and maintain existing airfield pavements to maximize their useful lives and the economic value of the pavement. Some of these items are not currently eligible for FAA funding.



7.0 ENVIRONMENTAL CONSIDERATIONS

The Environmental considerations addressed and the information gathered in this section follow the FAA Order 5050.4A, The Airport Environmental Handbook. A brief summary of environmental issues reviewed for the ALP update is below.

Agricultural

Because no federal lands are proposed to be committed or otherwise involved in the various planned projects, the Farmland Protection Policy Act (FPPA) does not apply to this plan and no further analysis in under this impact category is necessary to demonstrate compliance with NEPA.

Air

Air quality in the airport vicinity is not expected to be adversely impacted as the result of future airport operations or development. According to Washington Department of Ecology information, Colfax is "in attainment for" (meaning 'in compliance with') applicable air quality standards for all pollutants. The modest forecast increase in air traffic and/or surface traffic anticipated is not expected to result in a significant increase in pollutant generation above current levels. Temporary construction-related air quality impacts are typically associated with dust generation during site preparation, which can be effectively mitigated through appropriate construction practices.

Biological

No biological assessments have been conducted for the airport site. However, the Washington State Department of Natural Resources lists 30 "listed" plants in Whitman County, five of which are classified as "endangered": Jessica's Aster (*Aster jessicae*), Piper's milkvetch (*Astragalus riparius*), Broadfruit Mariposa (*Calochortus nitidus*), Northwest Raspberry (*rubus nigerrimus*) and Douglas Clover (*Trifolium douglasii*). Potential state listed animal species of concern include Tiger Salamander, Ferruginous Hawk, and Burrowing Owl. No endangered listed species are known to be on or near the site. A biological assessment is required for "construction projects (or other undertakings having similar physical impacts) which are major federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (NEPA) (42 U.S.C. 4332 (2) (c)). For projects other than major construction activities, the USFWS generally suggests that a biological evaluation, similar to the biological assessment, be prepared to determine whether they may affect listed and proposed species. A review of the Washington State US Fish and Wildlife Service's National Wetlands Inventory (NWI), indicates that there are no wetlands mapped on or near the airport.



Flood Plains

The airport site is located outside the nearest 100-year and 500-year flood plains in the local area. The nearby drainages run northeast to southwest roughly parallel to the east-west runway. Tributaries of the seasonal Rebel Flat Creek intersect Rebel Flat Creek to the west, north and south of the airport. Rebel Flat Creek is about ¼ mile to the west. The airport lies within the Palouse River Watershed. The nearest major watersheds are the Lower Crab (west) and Upper Crab (north).

Historical & Cultural

No known sites of historical or cultural significance are documented for the airport site. If any historic or cultural resources are discovered during construction, the Port is responsible for immediately notifying the state historic preservation office, area Tribes, and the other appropriate authorities. Work would be required to be halted until the physical extent and relative cultural significance of the resource(s) could be identified, and a protection plan developed and implemented, if warranted.

Noise Impact

The challenge to evaluating noise impacts lies in determining what amount and what kind of sound constitutes noise. A methodology has been devised to relate measurable sound from a variety of sources to community response. It has been termed “Day-Night Average Sound Level” (DNL) and has been adopted by the U.S. Environmental Protection Agency (EPA), the Department of Housing and Urban Development (HUD), and the Federal Aviation Administration (FAA) for use in evaluating noise impacts. Federal regulatory agencies, such as the aforementioned, have adopted standards and suggested guidelines relating DNL to compatible land uses. The accepted noise and land-use compatibility guideline strongly support the concept that significant annoyance from aircraft noise levels does not occur outside a 65 DNL noise contour. Part 150, Airport Noise Compatibility Planning of the Federal Aviation Regulations provides guidance for land-use compatibility around airports. The airport is located approximately three miles from Colfax and is completely surrounded by agricultural land. Based upon the type of aircraft and operations occurring at POWBAC, experience indicates that the 65 DNL noise contour will not leave airport and industrial park property and there are no land uses incompatible with those noise levels.

Soils

Soil at the airport is classified as Covello Silt Loam, which consists of nearly level, somewhat poorly drained soils that formed in alluvium from loess and varying amounts of volcanic ash. Covello soils are used to grow grain, legumes, and grass, and they also support range and wildlife habitat. The representative profile is described as dark grayish brown calcareous silt loam about 30 inches thick, underlain by a white silt loam to a depth of 51 inches. Underlying this, to a depth



of 60 inches, is light brownish-grey silty clay. This clay developed under hairgrass, sedges and willows. It occupies nearly level to very steep lands in the central part of the county. The elevations range from 1,500 to 2,200 feet. The soils receive an annual precipitation of 15 to 20 inches.

Water & Wastewater

Water quality impacts are always a concern with a permanent increase in impervious surfaces or temporary affects related to construction. Glycol based de-icing agents are not used at the airport, although minor dispersing of petroleum-based residues is common on runways, taxiways and aircraft parking aprons. The existing airport drainage system consists of surface sheet drainage to surround agricultural land and open ditches that flow to Rebel Flat Creek. Several aerial applicators operate from the airport and those operators are required to comply with all applicable state and federal rules for spill containment. Two very small spills were identified in 2001 during an environmental site assessment and those areas were cleaned up in 2002. Silt fences, runoff diversion tactics, and storm water detention are commonly implemented in similar construction projects, and should be utilized for any project on the airport to minimize adverse impacts of development related activities. FAA Advisory Circular 150/5370-10 provides additional measures and should be implemented to minimize adverse impacts of airport.

In addition to the requirement for securing wastewater permits for washing, maintenance, or deicing areas, the sponsor must secure a National Pollution Discharge Elimination System (NPDES) permit for any project affecting one acre or more of land and discharging storm water runoff to surface waters. During construction, adherence to the applicable local, state, and federal regulations and standards; observance of best management practices for storm water discharges; and compliance with the guidelines of FAA Advisory Circular 150/5370-10 are all advised to further protect against adverse water quality impacts.

A review of the Environmental Protection Agency (EPA) Envirofacts database indicates that no hazardous waste sites are documented on the airport site, although nine are listed north and north east of the airport (facilities that report hazardous waste activities). Whitman County Airport is listed with Washington State Department of Ecology (Identifier: 82194276) as being the site of an “inactive” underground storage tank associated with Fender Air. There are no listings for facilities that produce air or toxics releases.



8.0 AIRPORT LAYOUT PLAN (ALP) DRAWINGS

The preferred alternative for the long-term development of the Whitman Business Air Center is depicted on the Airport Layout Plan drawings. The ultimate runway configuration depicted on the ALP is also reflected in the associated airspace and land use plan drawings.

The set of airport plans, referred to as the “Airport Layout Plans,” has been prepared to graphically illustrate existing conditions, recommended changes in airfield facilities, property ownership, land use, and obstruction removal. The drawings at the end of this section were prepared in accordance with guidelines established by the Federal Aviation Administration (FAA):

- T1.1 Title Sheet
- C1.1 Airport Layout Plan
- C1.2 Airport Airspace Plan (FAR Part 77)
- C1.3 Airport Airspace Approach Plan and Profile (FAR Part 77)
- C1.4 Threshold Siting Plan and Profile
- C1.5 Existing Building Area Plan
- C1.6 Ultimate Building Area Plan
- C1.7 Land Use Drawing
- C1.8 Exhibit “A” Drawing (Property Map)